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A TEXT-BOOK

OF

# CLINICAL MEDICINE.

## TREATMENT.

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## VOLUME I.

THE FEVERS AND INFECTIONS, CONSTITUTIONAL DISEASES, DISEASES DUE TO ANIMAL PARASITES, INTOXICATIONS AND EFFECTS OF HEAT AND COLD, AND DISEASES OF THE DIGESTIVE AND RESPIRATORY APPARATUS.

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# PREFACE.

THE ultimate object of medicine is successful treatment. Let diagnosis and pathology advance to any extent, and it avails us nothing aside from its scientific interest, if it does not aid us in the prophylaxis and cure of disease. Fortunately for humanity, pathology and diagnosis have done much to rob disease of its terrors; still there remains much to be done before the medical world will reach its highest standard of efficiency. Of late years the advances in surgery have so overshadowed those of medical treatment that the latter have apparently escaped the attention they deserve. So it is that young men and many experienced practitioners have aspired to surgery and the various specialties to the neglect of internal medicine. This we hold is a serious error, for unless general medicine and therapeutics retain their prominent place at the head of the healing art, the specialties and surgery will suffer thereby.

It is customary for certain medical scientists to decry the value of therapeutics. What can be more unreasonable? Even in incurable cases it is the rule and not the exception that we give our patients comfort and relief and prolong life, while "an expectant course" would have been attended by suffering and misery. But patients will die; indeed, death is the ultimate end of all living things. In fighting the Grim Reaper we are engaged in unequal combat, for however successful we may be the many times, there will always come *the once* with every patient when we fail utterly; and it is that once which makes us feel our helplessness. In thus falling into despondency, we are doing medicine and ourselves an injustice. We should take credit for what we do, and blame neither ourselves nor others for our inability to attain the impossible.

When this work was planned, it was with the idea of making its therapeutic basis homœopathic, and this idea has been kept in mind from cover to cover. While the homœopathic application of drugs is unquestionably the best in its results, we must bear in mind that medicines may be required for their palliative or mechanical effects, and this fact has likewise been kept in mind by the author. Physicians must know the palliative and physiological action of drugs, not only that they may use them when indicated, but also to avoid them when they are entirely out of place.

Just as drugs may be required for their mechanical or physiological action in internal diseases, so may surgery itself be indicated. The author has endeavored to make clear the line where medical treatment ends and

surgical interference begins. Hence, when surgical treatment is needed in such diseases as typhoid fever, gastric ulcer, gastric carcinoma, and numerous other internal diseases, the indications calling for that aid are clearly given. In this part of the work, the author acknowledges the valuable assistance of Dr. W. B. Van Lennep, who, besides contributing the sections for which he is credited, has kindly criticized various articles bearing on the necessity for surgical treatment, such as the sections on Appendicitis, Intestinal Obstruction, and Nephrolithiasis.

Considerable attention has been devoted to the non-medicinal or adjuvant details of treatment. It is one thing to advise nitrogenous diet, electricity, exercise, rest and other physical agencies in a perfunctory way. It is another to determine how these shall be applied to individual patients, or in which diseases these adjuvant measures may best be prescribed. We must have a definite idea of what we aim to accomplish, and the indications for treatment before we proceed. We might also add that we should determine *how much we can accomplish in any given case.* Many times do we in our praiseworthy efforts to achieve the impossible do harm by neglecting the possible.

Treatment must always be conducted on a rational basis, let that basis be hygienic, homœopathic or palliative. It is exceptional that empiricism leads to successful results.

As medicine advances we all observe that it simplifies our problems greatly. This should give us a strong hint as to practice. Let us make our therapeutics and treatment the simplest possible. What is there simpler than the modern treatment of tuberculosis, and yet care must be observed in enforcing the details! Again, the treatment of typhoid fever is a simple matter as to principles involved, and yet how many ignore them by the unnecessary resort to useless if not actually harmful drugs. Let us employ uncomplicated treatment, and *above all things make sure that we do no harm.*

It has been the author's ambition to prepare a text-book on treatment that shall cover the domain of general medical practice. This necessitated the presentation of numerous subjects not ordinarily considered in medical works. In other words, he has presented matters of treatment relating to the various specialties as far as he believes the general practitioner should go. He has also endeavored to indicate when the general practitioner should regard such cases as suitable for reference to the specialist and surgeon. In his ambition to present the therapeutics of the various specialties he has enjoyed the valuable co-operation of numerous of his colleagues of the faculty of the Hahnemann Medical College of Philadelphia whose names are attached to the articles they have so kindly contributed.

The chapter on the "Opsonic Theory" is an innovation in a work on Treatment. The author felt that its insertion was imperative, as no "up-to-

date" work on treatment could be complete without it. It becomes especially important to the homœopath because it has bearing on the principles of our school of medicine. The author has chosen to present the claims of the "Opsonic Theory" as set forth by Wright and his followers, although we must all admit that much good work has been done in this direction without attention to the opsonic index as a guide. Indeed, there are many expert clinical laboratory workers who deny that the opsonic index possesses a practical clinical value. The author expresses many obligations to Dr. S. W. Sappington for placing at his disposal literature bearing on this subject, for without his kind assistance this chapter would not have been presented.

In conclusion, the author expresses the hope that this work will prove to be adapted to the wants of the general practitioner for whom it has been written.

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# CLINICAL MEDICINE.

## TREATMENT.

## CHAPTER I.

### FEVERS AND THE INFECTIONS.

As most of the diseases of which fever is a prominent feature belong to the group of acute infections, I have, for purposes of ready reference, included the treatment of fever in general and the infectious diseases in the same chapter.

### Fevers.

**General Remarks on the Treatment of Fever as a Symptom.**

The general management of fever resolves itself into the nursing or care of the patient by the family or trained attendant, proper feeding, and measures directed to the regulation of the pyrexia.

The nursing of the patient demands particular attention to physical and mental rest, accurate observation as to the condition of the emunctories, ventilation of the sick-room, arrangement of the bedding, and, when the fever belongs to the infectious group, the institution of measures designed to prevent the spread of the disease to other members of the family or to the community in general.

1. **Physical and Mental Rest.**—It is a well-recognized axiom in the care of febrile patients, that any rise of temperature, but especially a rise above 100° F., is a positive indication for putting the patient to bed. It matters not that many patients who do not act in accordance with this axiom, nevertheless make good recoveries. We know that very many lives have been lost, many acute illnesses prolonged, because patients with fever have not given up until bodily discomfort and sheer exhaustion have forced them to do what they should have done in the first place. Even in chronic diseases, as pulmonary tuberculosis, it is a good working rule to

order the patient to bed at any time the temperature rises to the point above named.

Going to bed does not, however, necessarily bring complete rest unless there is the exercise of common sense on the part of the attendants. After the directions of the physician have been carried out, there is great advantage in judiciously letting the patient alone. Constantly disturbing him to learn of his progress from minute to minute or half-hour to half-hour is strongly suggestive of the tactics of some people who when mending a piece of china or bric-a-brac pull at the fragments every few minutes to see if the parts are sticking. *Simplicity is the keynote of proper treatment.* Unnecessary measures should never be advised by the physician, even though they impress the family with his therapeutic ingenuity. Their enforcement makes a demand upon the patient, and thus interferes with the cardinal principle of rest.

The question of visitors is a most important and practical one. It is a good general rule to assume that all visitors do harm, as with but few exceptions, they disturb the patient's rest, and cause in many instances undue mental excitement which may long outlast their visits. But in enforcing this rule, some account must be taken of the temperament of the patient. It may be that rest will be better secured if a business associate is permitted to call in order to arrange affairs so that the patient can thereafter feel satisfied that his financial interests are properly secured. Such visits, of course, are not to be repeated. In the case of short illnesses, they are entirely unnecessary excepting under unusual circumstances. It may be also that the patient is especially desirous of visits from a near friend; and if said friend is tactful, his visits may be permitted with discretion under some circumstances. Even though certain visits are likely to do harm, they may sometimes be countenanced as the less of two evils, for the patient may fret himself unduly if he is not permitted their solace. On the other hand, the physician should not too readily accept statements on the part of the family as to the patient's temperament in this direction, for too often such a condition is more imaginary than real. Observe the facts in the case, and act according to the dictates of one's common sense. Children, of course, never require company. As most of their febrile illnesses are of the infectious type, it is always wise to exclude visitors, even to the parents, for the protection of the community.

Sleep is nature's great remedy, and should always be encouraged by natural means. In no other way do we secure complete bodily and mental rest. The patient should have just as many hours of sleep as he is accustomed to in health. If he secures any more, so much the better. A well-organized sick-room discipline ofttimes conduces to good sleep. This, of course, means that the nurse or attendant is tactful. The natural measures for promoting sleep include the banishment of noise and undue light

from the sick-room, proper feeding, and the curative treatment of the primary disorder. The exhibition of hypnotics is in most instances bad practice, especially so as they are necessary in exceptional instances only. When by persistence of the insomnia, notwithstanding the proper care and treatment of the patient, the patient's condition suffers thereby, some one of the sleep-producing drugs may be administered to tide the case over a few days ; but which one must be decided according to indications. This matter will be reviewed more extensively when speaking of the treatment of the individual fevers. Sometimes a simple hydrotherapeutic measure may be all that is required.

While thus referring to the necessity of giving patients sleep, and speaking of the occasional utility of hypnotics, I have never found it necessary to use them in my practice. In each case the wisest plan is to determine the cause of the insomnia and direct our therapeutic agencies against it. If I were obliged to use a hypnotic, my preference would be for *Veronal* in doses of seven grains at bedtime; but even then I would advise against its nightly repetition. Of the hydriatric measures, the hot wet-pack is usually the most efficient. Many cases are kept awake by the injudicious conduct and fussiness of family and friends. Many times have I seen cases that slept not a wink rest quietly for the balance of the illness after a good nurse had been placed in charge. Before we attempt to throttle wakefulness, let us therefore determine if simple measures will suffice.

As to remedies for the sleeplessness of fevers, *Belladonna*, *Hyoscyamus*, *Stramonium*, *Rhus tox.*, *Valerian*, *Pasiflora*, and *Hyoscine* are the most satisfactory.

The patient being asleep, it is a cardinal principle never to disturb him for either food or medicine excepting under most unusual conditions. To these reference will be made hereafter.

2. **The Condition of the Emunctories.**—Fever, in most instances, is a manifestation of toxæmia. A healthy activity of the excretions is therefore beneficial. This means that the attendants must make note of the daily quantity of urine, and the number of bowel movements and their character. In febrile diseases, we expect the urinary quantity to be diminished—sometimes greatly so. It is not necessary, nor is it desirable, to give drugs—diuretics—to correct this condition, for very good results are to be obtained by the administration of pure water. Regularity of bowel movement constitutes the main feature of the treatment of allopathic physicians. In altogether too many cases, they attempt nothing other than the administration of a purge or a laxative. Excellent as this measure may be many times, the excess to which it has been carried has led us to its neglect. If constipation exists at the onset of an acute febrile disorder, it is good practice to correct it by a full enema. If the results are not satisfactory, one may administer a mild purge, such as fractional doses of calomel repeated at short intervals until a result follows.

When we have good reason for believing that the fever is dependent upon a gastro-intestinal intoxication, we have a clearly-defined indication for emptying the bowels thoroughly, the most efficient purge for this purpose being the well known and popular Castor oil.

During the course of the illness, daily inquiry must be made as to the activity of the bowels. We must not assume that abnormal sluggishness will be spoken of by the attendant if it exists. I know herewith of what I am speaking, for more than once has my neglect of this important point led to the locking up of the bowels for several days, and the necessity of considerable distress to the patient in getting rid of the hardened fæcal masses. If full enemata of water or of water and glycerin (one quart of water to four ounces of glycerin) fail, by reason of the fæcal impaction in the rectum, a very valuable measure is the introduction into the rectum of eight ounces of warmed olive oil.

In the presence of a profound toxæmia, we may secure elimination by the introduction of more water than can be taken by the mouth. We may then resort to hypodermoclysis, enteroclysis, venous infusion of normal saline solution, etc. But in carrying out any of these lines of treatment, let us be careful not to overdo the matter. I have seen at least one case in which great alarm was excited by an injudicious pushing of high colon injections, the kidneys being forced to work to such an extent as to refuse to excrete any longer. It was no wonder that we had to deal with an alarming suppression of urine. Fortunately, the majority of such cases result favorably as soon as the pernicious treatment is stopped.

Certain of the febrile diseases are liable to be attended by nephritis as a complication. In this class we place typhoid fever, scarlatina, and diphtheria especially; although many of the acute infections, and even tonsillar inflammations, may occasionally be thus complicated. It is very important, therefore, that chemical and microscopic examination of the urine should be made from time to time. Their frequency will vary according to the nature of the primary disorder.

3. **Ventilation of the Sick-Room.**—Fresh air is a most important remedy for the sick. Unfortunately, it is not always possible to have ideal arrangements of the sick-room for securing it. The air capacity of the sick-room should be not less than 6,000 cubic feet. Ventilation must be free, for it has been estimated that the patient and his attendant consume about 3,000 cubic feet of air per hour. This means that the apartment must have windows so placed that they can be kept open without unduly exposing patient and nurse to the danger of "taking cold," as from drafts. As most of the pollution of the atmosphere finds its way to the upper strata of the room, ventilation must be secured, in part at least, by lowering the upper sash. In cold weather, this may depress the temperature of the room to an undue degree. This trouble may be obviated by placing

a properly fitting piece of board between the sash and the window frame, trusting to the space between the upper and lower sash for ventilation. In warm weather, lowering of the upper and raising of the lower sash is of course necessary, and free from possibility of bad results.

Vitiation of the atmosphere of the room at night by burning lights, as gas or lamp, must be avoided as much as it possibly can.

Bad odors may be removed by such deodorizers as Labarraque's solution and Platt's chlorides. The substitution of a bad odor by one less offensive, as cologne water or burning joss-sticks, is not good practice.

The important thing about the arrangement of the bed is cleanliness, which means good order of the coverings and the freedom from soil. The most frequently observed error, however, is found in the bundling up of the patient with multiple layers of sheets and blankets, a practice to be condemned.

4. **Feeding of the Patient.**—It is a general rule to find that the gastric and intestinal secretions are much diminished in the course of febrile disorders. Even the secretions present are not always of good functional quality. Poor appetite and feeble digestive powers are the common accompaniments of fever. In short lasting cases, the feeding of the patient is a very simple matter, as a rest of the digestive apparatus for a few days more or less does no harm. But when the fever is of long continuance, and the destructive changes due to the high bodily temperature are added to those of limited feeding, the question of diet becomes a most important one.

Liquid foods should constitute the sole diet of the fever patient. Of these, milk fulfills the indications present better than any other food. It is easily digested, and it contains a high degree of nutriment. Objections are offered to its use by some persons, who declare that it habitually disagrees with them, or makes them "bilious." As a matter of fact, these idiosyncrasies to milk are imaginary. With a little perseverance the patient can overcome his dislike to it. In other instances, some artifice on the part of the physician or nurse may induce the patient to take it regularly. A more important objection to milk as a diet is its liability to form large, heavy indigestible curds shortly after entrance into the stomach. This may be obviated by diluting the milk with barley water, predigesting it with pancreatin, or the addition of a small quantity of citrate of soda. The quantity of milk to be given daily must be governed by the conditions present. In the short lasting fevers, as I have said before, the question of maintaining the full standard of nutrition does not present itself. In those of considerable duration, on the other hand, the patient must be nourished to the utmost. In this case, the quantity of milk taken should be not less than three pints, and better four pints, in the twenty-four hours. To secure this result, eight ounces should be administered every three hours.

It is not uncommon for a milk diet to become monotonous. We may

then resort to various fluid preparations of meat, such as broths and clear soups. To attract the patient's palate, the diet may be further varied by purees, which are but clear soups thickened with well-cooked arrow-root, finely-ground rice, or thoroughly baked wheat flour.

When the patient is not seriously ill, more dietetic liberties than above outlined may be permitted. While solid food is never admissible during the febrile period, semi-solid articles like milk toast, cream toast, well-boiled rice, rice pudding, poached eggs, gelatin, and dry toast are often greatly enjoyed and can do no harm.

While thus advocating the liquid diet as the ideal in the management of fevers, there are conditions, rare, it is true, in which it may be necessary to nourish the patient more thoroughly than is thereby afforded. Such cases belong almost exclusively to suppurative diseases or to tuberculosis. Even then, I would not consider solid food admissible unless the tongue be clean and moist and the gastro-intestinal functions in first-class condition.

Water constitutes a most important article of diet for the fever patient. This point is too frequently neglected, through thoughtlessness, of course. Because the patient takes his food in the form of liquids affords no reason why he needs no water. Water is required to allay thirst, and as an agent to aid the elimination of waste products by way of the kidneys. The acidulation of drinks as by lemon juice has no therapeutic influence. Any benefit derived is due to the pleasure thus given the patient.

Tea and coffee may be prescribed if judgment is used. Their main liability to do harm rests in the possibility of their exciting an enfeebled patient to the extent of producing insomnia. Such action may result even in persons who have long been accustomed to taking coffee in large quantities in health. Coffee may be utilized in some cases because of its effects as a cardiac tonic and diuretic. Tea must not be given when there is coincident disorder of the stomach.

Ice may be allowed if the patient desires it. It should be given in small pieces, and taken slowly. It does not relieve thirst as well as does water slowly sipped.

5. **Measures for the Reduction of Temperature.**—The indiscriminate use of measures designed for the reduction of temperature apart from the treatment of the primary cause is to be strongly deprecated. Circumstances do arise occasionally in which the temperature attains such a high point as of itself to be a source of real danger. Then, curative remedies not acting with sufficient promptness, antipyretic measures may be employed. It must be borne in mind that pyrexia is not infrequently a conservative process. The infection seems in many instances to follow a more favorable course if the patient exhibits moderate fever. This is well exemplified in the apyretic cases of typhoid, which are followed by high mortality. In diphtheria also we are inclined to a gloomy prognosis when

profound constitutional and severe local symptoms are attended by low fever. So, when we employ antipyretic measures, it is a good plan to regulate but not throttle the fever.

The measures advised for the reduction of temperature include drugs—the so-called antipyretics—and hydrotherapy.

The principal antipyretic drugs are *Acetanilid* and *Antipyrin*. They are both cardiac depressants. Their administration is not, therefore, to be countenanced in the asthenic fevers, as typhoid fever and septicæmia. I would limit their use to certain cases of pulmonary tuberculosis in which the pyrexia constitutes about the only outward manifestation of the illness. Here, I have several times given Acetanilid in doses of from five to ten grains about an hour before the time when the temperature is expected to rise, and with good results. Ordinarily, however, it is much better to depend upon the general measures and curative remedies for our results. In tuberculosis, the fever does not seem to be a conservative process.

Hydriatric measures constitute by all odds the best means for control of temperature. Of these we have quite a variety at our disposal. Of their relative merits, I will speak when describing the treatment of the various febrile disorders.

Of remedies adapted to febrile processes in general, I may mention at this time *Aconite*, *Belladonna*, *Ferrum phos.*, *Gelsemium*, and *Veratrum viride*.

Of these *Aconite* enjoys the greatest reputation, and is used with confidence by both schools of medicine. It is indicated in the sthenic types of fever, characterized by dryness of the skin, full bounding pulse, and general restlessness with anxiety. The fever is essentially a continuous one, the temperature remaining at approximately the same level until the crisis, with its associated sweat, appears. The most satisfactory dosage has been found to be drop doses of the first decimal dilution or tincture every hour.

*Belladonna* is the remedy for the fevers attendant upon localized inflammatory processes, and in those which are associated with well-defined cerebral disturbance. The high temperature is not uncommonly associated with a profuse hot sweat. The pulse is full and bounding. The arteries of the head and neck are seen to pulsate violently. Usually, the patient complains of severe throbbing headache. In children, the above state of affairs is usually associated with cerebral or nervous disturbances; such, for example, as hallucinations, twitchings and jerking during sleep, and even active delirium. In adults, it is exceptional for the fever *per se* to exert such an effect upon the brain. When these symptoms do appear in association with fever in them, the case belongs, as a rule, to the asthenic variety, and the remedies indicated are *Bryonia*, *Hyoscyamus*, *Stramonium*, *Rhus*, *Baptisia*, and similarly acting drugs. The best dosage is the first decimal dilution in drop doses at hourly intervals.

*Gelsemium* is indicated in fever assuming the remittent types. The vascular pressure is subnormal, as shown by the softness of the pulse. Such a condition is associated with considerable languor or weakness and drowsiness. Associated chills are not uncommon. The skin is commonly moist.

*Ferrum phos.* presents two prominent indications: one is the low vascular pressure, and the other is localized congestion. The latter condition is manifested by blood-stained discharges from the affected part, as the blood-streaked sputum in the first stage of pneumonia, the admixture of blood and mucus in dysentery, etc.

*Veratrum viride* finds its important indication in the sudden accession of high temperature with disproportionate rapidity of the pulse. The tincture should be used at intervals of one-half to two hours, one drop at each dose.

*Eucalyptus.*—Willard, of Denver,* believes that the special sphere of Eucalyptus is in continued and typhoid fevers, and not in intermittents, as is currently believed. It is indicated when the discharges show a tendency to foulness, with high temperature, pulse accelerated, but not strong. It will change the character of the case promptly, improving the condition of the alimentary canal as regards sepsis and reducing the temperature. He believes that the remedy is specifically curative in fevers. The provings, as given by Cowperthwaite, show that it increases the action of the heart, lowers the arterial tension, and induces a feverish state corresponding to that found in malarial, remittent, and typhoid fevers.

Having thus reviewed the management of fevers in a general way, it is next in order to speak in detail of the various fevers in particular.

## Typhoid Fever.

(***Enteric fever; typhus abdominalis; pythogenic fever; autumnal fever; gastric remittent fever.***)

**Prophylaxis.**—Typhoid fever is one of the most readily preventable of diseases. The majority of cases originate in contaminated water supply; but milk, infected foods, are occasional causes. When typhoid fever exists in a community, it is the duty of all housekeepers to see that all water used for culinary and drinking purposes is boiled.

Municipalities can greatly lessen the frequency of the disease in their midst by the construction of large filter-plants. These, of course, can only be efficient when properly constructed and carefully watched.

Infected milk has been the cause of a number of small epidemics. In most of the cases the infection originates in the use of infected water for washing out the cans or adulterating the milk. Milk products, but especially butter, may convey the disease.

Vegetables and fruits which are eaten raw may, under certain circum-

* *The Critique*, 1898.

stances, become a source of danger. For example, celery grown in gardens with infected dirt; oysters taken from beds in waters contaminated with sewage; fruits and vegetables which have been washed with infected water.

Typhoid fever patients are an important means of carrying the infection, usually by way of careless disposal of fæces and urine. It has long been taken for granted that this danger ceases with recovery, but recent observations have demonstrated that it may continue indefinitely. Quite recently there has been reported an instance in which a cook, going from one situation to another for a period of ten years, brought typhoid fever with her into every household. Bacteriological examination demonstrated that her stools were swarming with the bacillus typhosus. The fact that the urines of patients who have had typhoid are dangerous for many months after recovery has been known for a long time.

The possibility of infection being carried by the sputum and other secretions must also be considered.

The fæces and urine being the principal carriers of infection should receive special attention. Immediately after the patient has used the bed-pan, the stool should be covered with a disinfecting solution, preferably a 5 per cent. solution of carbolic acid, 1 per cent. chloride of lime, or 1:1000 of mercuric chloride. Under no circumstances should the bed-pan or commode be left uncovered, because flies, by lighting on the stools, may carry the bacilli to eating utensils and to food already prepared for the table.

The urine should be disinfected with either mercuric chloride or chloride of lime.

Fæces and urine should be permitted to remain fifteen minutes to half an hour exposed to the action of the antiseptic before throwing them into the water-closet.

Typhoid fever discharges should never be thrown on the open ground, and especially near the banks of streams.

Though not a necessary precaution, it is probably wise that all water used for bathing typhoid fever patients be disinfected before throwing it away.

Owing to the migratory habits of the house-fly, the typhoid patient should be protected by suitable mosquito-netting.

Protective inoculations have been practiced in the British army, apparently with considerable success, both as to the frequency of infection and the mortality percentage of those infected.

The statistics thus far at our disposal have been derived from the experience of the British Army in South Africa and India. The figures which were compiled by Wright are as follows: Of 19,069 soldiers receiving protective inoculations, 226 were stricken with typhoid fever, or a proportion of 1:84.4. The mortality among these was 17 per cent. Of 150,231 non-

inoculated soldiers, 3,739 took the disease, or 1:40, and 25 per cent. of these died. The whole question requires much more elaboration and investigation before it can be utilized in civil practice.

**Treatment.**—Most of the old-school authorities express themselves very strongly in favor of a preliminary purge in the treatment of typhoid fever. They argue that a dose of calomel, by cleaning out the intestinal tract, serves to mitigate the severity of the illness by lessening the number of intra-intestinal micro-organisms. This practice, I know, is followed by a number of our physicians, though not advocated in our literature. It is of interest in this connection to learn that there is a growing conviction on the part of those with the most experience that this early purgation is not good practice, and that it is ofttimes the sole cause of diarrhœa. Personally, I have never seen any necessity for the procedure, and have never had cause to regret my stand in this respect.

In no disease is it more important that the physician should exercise a watchful supervision over the symptoms, making comparisons of the changes made in them from day to day, or even from hour to hour. All physicians are alive to the state of the temperature and pulse; but the respiratory frequency is likewise of great importance, as it at times sounds the first warning of involvement of the respiratory tract, or of some unexpected complication. He must make systematic investigation of the following at each visit: The condition of the tongue, the state of the skin as to moisture, eruptions, bed-sores or signs of beginning of same; cleanliness of patient, as shown by odor; the state of the digestion, as determined by sensations after feeding and gastric symptoms in general; the action of the bowels, whether constipated or free; the character of the stools; the presence or absence of meteorism, abdominal pain, tenderness or rigidity; the mental condition of the patient; sleep; and the condition and character of the respiratory system. The nurse should be instructed to note the quantity of the urine, the quantity of food taken, any unusual manifestation of pain, the presence in the stools of undigested milk curds or blood. All examinations should be conducted without any fussiness, for it is possible for the tactless to carry them out with such bad technique as to do the patient more harm than good by going into any unnecessary labors, or by pursuing his physical investigations with more energy than good sense.

If rest is an important matter in the presence of high temperature as a symptom, it is many times more so when the presence or possibility of typhoid fever is even suspected. Here we have a disease characterized by a prolonged fever, resulting in serious changes in the cardio-vascular system. One of the strongest, if not the strongest, indication in the treatment is the saving of all wear and tear possible on the heart in particular. For this reason, the physician must not compromise with error in the treatment of this disease. Early rest is a good thing and must be enforced.

I would even go to the extreme of ordering that rest to be as absolute as it would be if the patient was in dire *extremis*. If the diagnosis of typhoid fever is merely tentative and not positive, the safety of the patient demands that the patient should be treated with all the stringency demanded in the latter case. So important do I regard early rest in the treatment of typhoid fever patients, I would assert my belief that the mortality of the disease would be practically *nil* if all cases were placed under a rigid treatment at the very onset of the illness. In personal, hospital, and consultation cases, all deaths so far under my observation have been in patients who were permitted to go about for several days before the illness forced them to take to their beds. If a person is unfortunate enough to be taken ill away from his home, it is the best policy not to expose him to the fatigue of a railroad journey unless the facilities for his care are inadequate, or the family have the means for furnishing him with unusual comforts and safeguards on the trip home.

Throughout the course of the disease, the idea of rest must be kept in mind. Therapeutic measures which unduly disturb must be forbidden. The patient should not be permitted to help himself in any particular, but should leave all such matters to the nurse. Under no circumstances should the patient be permitted to rise to the commode for defecation and micturition; but the use of the bed-pan must be insisted upon. Many patients contend that they cannot attend to themselves in a recumbent position. In most instances, their inability to do so is really notional. A little encouragement on the part of the nurse or family, a little perseverance on their own part, and there will be no trouble. Once in a great while we will encounter a patient to whom the bed-pan is an impossibility. Under such circumstances it is better to forgo its use, rather than to persist in annoying the patient. In young children, of course, the bed-pan is a practical impossibility. Fortunately, in them, its use is not so important, for they are more readily lifted to the commode by the nurse, and their youthful tissues withstand the ravages of the typhoid toxæmia better than in the case of adults.

The possibility of infection of the healthy by the patient ill with typhoid fever is remote, providing ordinary care is taken in the disposal of the excreta and of the cloths used in cleansing the patient. Certain it is that mere presence in the sick-room is not capable of transmitting the infection. Experiments have, it is true, demonstrated the presence of the typhoid bacilli in the expired air; but these experiments hardly duplicate conditions of practical life. Nevertheless, it is wise not to tempt nature too far, and to avoid unnecessary exposure. Visitors are to be forbidden entrance to the sick-room because of their injurious influence over the patient, and not for their own protection. Attempts at amusing the patient are to be looked upon as both ridiculous and harmful. I have never seen a typhoid patient who required them.

Attention must be paid to details in selecting the sick-room. It should be large, easily ventilated, and preferably with a southern exposure. The length of time the patient is obliged to remain in it makes this a matter of the greatest importance. The ordinary recommendation that the room be located on the third floor is all right theoretically. No doubt such location is more airy and less noisy, but the additional flight of stairs forced on the nurse or attendants detracts from the care received by the patient in many instances. Most nurses are thoroughly tired after three or four weeks' attendance upon a severe typhoid, even under favorable circumstances. Unnecessary labors will impair their efficiency. The temperature of the room must be about 70° F. Screens must be placed so as to protect the patient from drafts and glares of light.

The bed should, if possible, be a single one. Not only does such a bed make it easier for the nurse to minister to the patient, but it greatly simplifies the efforts at examination made by the physician. The mattress must be of hair, and of moderate firmness. Under no circumstances should a feather bed be used. It is a wise plan to have a rubber cloth spread under the sheet, which must be kept smooth and free from dirt of all kinds.

The patient's position must be changed from time to time. As a rule, the invalid himself will attend to this matter. In case of unconsciousness or low muttering delirium, however, he is apt to lie on his back most of the time. Such a posture, unless changed occasionally by the nurse, not infrequently leads to the formation of bed-sores or to hypostatic pneumonia.

Too much cannot be said in favor of cleanliness. It is not sufficient to bathe or sponge the patient each day. Cleanliness means much more than this. The patient's skin should be rubbed with alcohol twice daily. After each stool, the regular cleaning should be followed by a washing of the buttocks and adjacent parts with a carbolic acid lotion of 2 per cent. strength. The mouth must be washed thoroughly with some mild antiseptic lotion, of which *Boric acid, Listerine, Glyco-thymoline* may be mentioned. Thus may we keep the mouth and gums free from sordes. Accumulations of mucus and dead skin must be removed from the lips. These undoubtedly contain the Eberth bacillus. It is not uncommon to see flies lighting upon the lips of the typhoid patient. Carelessness then n this point means the spread of the disease. The patient's finger nails must be scrubbed regularly. They almost invariably conceal infectious material. It is possible that some relapses are due to reinfection brought about through this source.

The feeding of the typhoid fever patient is really a very simple matter in most instances, as there is little opportunity for variety. Milk is universally acknowledged to be the best food. Individuals may differ as to the best manner of giving it, but as to its value there is no diversity of

opinion. Milk of good quality should, in the majority of cases, be given in quantities of eight ounces at intervals of three hours. The sustaining character of this diet may be increased by the substitution of a part of the milk—say one-fourth—by an equal quantity of cream. The patient should thus take from three to four pints of nourishment in the twenty-four hours. Some advocate a smaller quantity than this, namely, 30 to 36 ounces. The nurse must carefully inspect every stool, looking particularly for milk curds. Their presence shows either that we are feeding the patient too much, or that his digestive powers are weak. In either case, a modification of the diet is demanded. We may then lessen the quantity of milk, or we may dilute it with substances which tend to obviate the tendency of milk to form large curds in the stomach. We may substitute a good broth for an equal quantity of the milk. The broth selected may be made from beef, mutton, or chicken. If diarrhœa is present, broths must be prescribed with caution. Clam bouillon and oyster soup may be regarded as good alternative foods. Peptonized milk is most excellent in many instances. If, despite all modification, milk still disagrees, we may prescribe whey or albumen water.

The monotony of a milk diet may be relieved somewhat by the use of certain diluents, notably Vichy, Apollinaris, Seltzer, barley, or lime water. When the taste of the milk becomes objectionable it may be removed by the addition of a small quantity of coffee, or a cup of cocoa, in which milk is almost the sole constituent, may be given.

When the stomach becomes irritable and vomiting ensues, the milk should be given in smaller quantities and at longer intervals for a time, or one of the fermented preparations of that food administered. These include especially koumyss, but matzoon, kefir, and zoolak are also available.

Of proprietary foods, we may employ, when necessary, Mellin's, Eskay's, or Nestle's food, or malted milk.

Once in a while we may find farinaceous gruels of value. As a rule, they are objectionable because of their liability to excite tympany.

While thus expressing myself as an advocate of maintaining the strength of a typhoid fever patient by means of suitable nutriment, there nevertheless arise not a few cases in which the doctrine of feeding does not seem to apply. These are cases in which the food administered does not seem to be assimilated. In them excess must do harm rather than good. Under such circumstances a plan involving temporary starvation of the patient with a plentiful administration of water is indicated. It is held by some that diarrhœa and tympanites during the course of typhoid fever are not essential symptoms of the disease, but are in reality the direct result of injudicious attempts at forcing nutrition. In some instances, it is a wise plan to withhold nutriment for two or three days, diminution of the distention and diarrhœa promptly resulting. Even the toxæmia with its accom-

panying subsultus may at times be treated by temporary starvation. Probably the best indication for the starvation plan is the appetite of the patient. If that is poor, it is wise not to force food too energetically.

While firmly grounded in my belief in the value of the above-described instructions as to the dietetic management of typhoid fever patients, I am not unmindful of the occasional value of the teachings of those who are willing to permit a greater freedom in the selection of aliments. Thus Shattuck* recommends the following:

"(*a*) Milk: hot or cold, with or without salt, diluted with lime water, soda water, Apollinaris or Vichy; peptonized milk; cream and water (*i.e.*, less albumen); milk with white of egg, buttermilk, koumyss, matzoon, milk whey, milk with tea, coffee, cocoa.

"(*b*) Soups: beef, veal, chicken, tomato, potato, oyster, mutton, pea, bean, squash; carefully strained and thickened with rice (powdered), arrow-root, flour, milk or cream, egg, barley.

"(*c*) Horlick's food; Mellin's food; malted milk.

"(*d*) Beef juice.

"(*e*) Gruels: strained cornmeal, crackers, flour, barley water, toast water, albumen water with lemon juice.

"(*f*) Ice cream.

"(*g*) Egg, soft boiled or raw; egg-nog.

"(*h*) Finely minced lean meat, scraped meat, the soft part of raw oysters, soft crackers with milk or water, soft puddings without raisins, soft toast without the crust, blanc mange, wine jelly, apple sauce, and macaroni."

Some other authors are much more liberal than Shattuck. Their teachings impress me as altogether too radical. The danger incident to too liberal diet lies not so much in the danger of intestinal hæmorrhage and perforation from the administration of solid food, as it is in the defective gastric and intestinal secretions, which, after all, are able to take care of but a limited amount of nourishment.

The typhoid fever patient needs water, and plenty of it. This fact is not sufficiently recognized in practice. It is too often assumed that because the diet is of liquid substances only, that nothing is needed to assuage thirst. The value of a liberal allowance of water is so great that its systematic administration has been elevated to the dignity of a special treatment of the disease, and good results have been reported by its adherents. During the early days of the fever, when the patient's mind is clear, but little difficulty is observed with the water question, for the patient asks for it. Later, when his sensibilities become obtunded, he fails to do so, and then there is danger of neglecting this all-important point. Water, it must be remembered, is the best depurating agent known. Better than any other substance it removes toxic substances from the blood, and aids elimination by

* Quoted from Forchheimer's *Prophylaxis and Treatment of Disease*, p. 17.

way of the bowels and the kidneys. Some physicians carry the water administration to an extreme, and insist upon free libations at short intervals, so that the patient gets as much as 100 ounces in the 24 hours.

There is no doubt that the free administration of water causes the disease to run a milder course; the fever is less severe; and toxæmia is unlikely to occur. The elimination takes place by the kidneys, and in consequence we may have a free discharge of urine. This calls up an interesting question relating to prognosis. About a year ago, a writer in the *British Medical Journal* made the statement that the prognosis is invariably favorable when the urine is normal or excessive in quantity. I have watched this point carefully since my attention was directed to it, and have seen some remarkably severe cases recover when the urinary excretion was free.

When in the advanced stages of the disease, the patient becomes delirious and subsultus tendinum is a prominent symptom, there is nothing which will do as much good as a hypodermoclysis of normal salt solution to the amount of one pint or more daily. When the case is of great urgency, the salt solution may be introduced directly into a vein, the quantity to be used being one quart.

The majority of cases of typhoid fever do very well without the administration of alcoholic beverages. But there remains a large number to whom their administration becomes at some time an absolute necessity. When in doubt as to whether to give alcohol or not, the general rule of Murchison is a good one for guidance. Patients after the age of forty usually require it; those who have not reached that period of life will do as well without it. It is also of importance to know something concerning the patient's past history as to the use of alcohol. If he has been a regular though not necessarily a heavy drinker, his habits should not be changed during the illness. If he has at some previous time been addicted to alcoholic excesses and has reformed, it is unwise to run the risk of renewing his old appetite, unless the indications for the administration of alcohol are unmistakable.

The special indications governing its selection in individual cases include progressive cardiac weakness, hyperpyrexia, pulmonary complications, uncontrollable diarrhœa, post-hæmorrhagic prostration, delirium and subsultus tendinum. The good results of its administration are found in better cardiac action, lowering of temperature, gradual return of strength, subsidence of delirium, and quiet, restful sleep.

While it is necessary for the physician to specify particularly the interval between doses, and the exact quantity to be administered each time, such dosage must not be followed in too "hide-bound" a manner. I have seen alcohol excite delirium in some cases and produce what appeared to be a dangerous coma in others. It is important, therefore, for the physician to keep a close watch on the progress of his patient lest a deleterious overaction ensue.

Brandy or whisky will usually be found to be the best alcoholic for the typhoid. The dose may range from one-half to two ounces every four hours. The nurse should be instructed to observe the odor of the patient's breath, for if the alcohol can be detected on it longer than two hours after taking, the quantity must be reduced. In all cases, the whisky or brandy must be diluted with water or milk.

In women, whisky or brandy may be objectionable. We may then advise Hungarian wines, Malaga, port, sherry, claret, champagne, etc.

Theoretical objections have been urged to the use of alcohol in typhoid fever. Personally, I believe that such objections are of weight only as a precaution against its injudicious use. It is well known that the heart muscle undergoes degeneration in those addicted to its regular use. It is claimed that the same result may ensue upon its free administration in a disease like typhoid fever which predisposes to the same pathological lesion. There can be no doubt as to the beneficient action of the drug in stimulating the heart when administered for a short time only. It would seem, therefore, that when alcohol is used as a cardiac stimulant it must not be administered over too prolonged a period. Another theoretical objection to the administration of alcohol in typhoid fever, is the ability of the drug to produce cirrhosis of the liver, owing to the fact that in this disease there not infrequently occurs a focal necrosis of the liver cells. Alcohol is especially liable to exert an undesirable action upon the liver when administered to patients who are not taking much food. It is conceivable that in such it may prevent normal repair and thus lead to permanent changes in the liver structure. This objection argues more against the long continuance of alcohol administration rather than against its entire prohibition.

We now come to the discussion of the all-important question of hydriatric measures. The Brand treatment, or "tubbing" as it is popularly called in this country, is conceded by all who have employed it systematically to be of great value. Unfortunately, its proper practice demands such care as to make its use impossible for private patients. Cases treated by the Brand method must have two nurses, and for a time, at least, after the treatment is instituted the physician must be present at each bath. Many patients object to it. Osler, himself a strong advocate of the Brand treatment, says of it: "While I enforce the method for its results, I am not enamored of the practice. I have been criticized rather sharply for saying harsh words about the Brand system. To-day when I hear a young girl say that she enjoys the bath, I accept the criticism and feel it just; but to-morrow, when I hear a poor fellow (who has been dumped like Falstaff 'hissing hot' into a cold tub), chattering out maledictions upon nurses and doctors, I am inclined to resent it, and to pray for a method which may be, while equally life-saving, to put it mildly, less disagreeable." It is esti-

mated that in hospital practice the mortality of typhoid fever is reduced by about 6 per cent. by the Brand treatment.

The indication for the bath is a rectal temperature of 102.5° F. or over. The treatments should be repeated every three hours, if indicated by the temperature. They consist of immersion of the patient in water at a temperature of 70° to 80° F., combined with brisk friction of the submerged parts of the body. To give the bath, a portable tub filled with water sufficiently to cover the patient's body up to his neck is brought to the bedside. An air-cushion or pillow should be so placed as to support his head. After removing his clothes, he must be carefully lifted from the bed into the tub. In some cases, the patient objects most strenuously to this, insisting upon performing this service himself. While he lies in the tub, every portion of the body in turn should be rubbed vigorously by the attendants. After fifteen minutes he should be lifted out, put back to bed, dried or not, as the physician directs, and covered with a sheet and blanket. If he is not dried at once, he is permitted to lie quiet for twenty minutes, when he is rubbed dry, and his clothing is then adjusted. It is a good plan to give the patient a small quantity of whisky—about half an ounce—before and after the bath. Any slight degree of shivering either during or after the bath can be disregarded, for this is not unusual; but if cyanosis appears the patient must be removed from the bath at once, put back to bed, well-stimulated by friction, and hot-water bottles should be placed about his feet and body.

Those who have had the greatest experience with the Brand treatment do not attach so much importance to the lowering of the temperature by each bath as to the regulation of the fever and keeping it within safe bounds throughout its entire course. Some have even regarded a zig-zag temperature curve in a case treated by tubbing as indicative of bad practice. It is not to be expected that the temperature will fall abruptly after bathing. The change that comes will not be manifested until several days. The advocates of the bath claim for it reduced mortality, regulation of the fever, absence of delirium and nervous symptoms, and lessened tendency to complications, especially of the respiratory apparatus, and strengthening of cardiac action.

The only contra-indications to the bath treatment are peritonitis and intestinal hæmorrhage.

The impracticability of introducing the bath treatment into private homes necessitates recourse to other hydriatric measures for regular practice. As a substitute, I believe the cold-mitten rub is the most satisfactory, and gives most excellent results. For this, the patient need not be removed from this bed, and the materials required are to be had in every household. Before getting the patient ready, the nurse has at hand one rough bath-mitten, a bath thermometer, a vessel containing one gallon of

water, hot water and ice to regulate the temperature of the bath to the prescribed degree, a rubber sheet, a blanket and towels. The patient is placed upon the rubber sheeting, which has been covered by the blanket. His face, head and neck are then bathed with cold water. We then proceed to give him the cool-mitten rub. We begin by uncovering the thorax. The nurse dips the mitten in the cold water—at the first seance, at a temperature of 85° F.—and rubs the surface of the body with sufficient vigor to excite quite a glow. Then the thorax is wiped dry with a towel. Portion after portion of the body in turn is treated in like manner. When the operation is completed, the rubber sheeting and blanket are removed, the patient properly clothed, and permitted to rest. The indication for repetition of the treatment is the same as for the bath, namely, a rectal temperature of 102.5° F., but at intervals not less than three hours. A second rubbing may be given at a temperature of 80° F.; a third, at 75° F.; a fourth, at 70° F.; a fifth, at 65° F., which is, as a rule, as low as we are likely to go, though in extreme cases we may use the water at a temperature as low as 45° F.

Cases of typhoid fever treated by the cold-mitten rub run a favorable course. Indeed, those who have tried both it and the "tubbing" claim for it fully as good results with decidedly less disturbance of the patient. The treatments do not have any marked influence in rapidly reducing the fever; they simply keep it within bounds.

R. W. Wilcox thinks highly of the bed or slush bath and the *sprinkle bath* as substitutes for tubbing. To give the *bed* or *slush* bath proceed as follows: Roll blankets around the edge of the bed "so as to form a sort of a wall. Over this is placed a rubber sheet or piece of table oil-cloth, and into the trough thus formed several pails of water are poured. The patient is then placed in this and treated just as when the tub bath is employed. The bed bath may be constructed also by passing a piece of clothes line around the head and foot of the bed, connecting these two by parallel ropes, and throwing over the whole an oil-cloth, which is attached to the rope by clothes pins; or a rectangular fence about eight inches in height and slightly smaller than the mattress may be constructed, over which a rubber sheet may be thrown. The water from these improvised tubs is best drawn off by a siphon made of a few feet of rubber hose."

The *sprinkle bath* is considered by Wilcox as a true rival of the tub bath. He says it has the advantage of being better borne "and of peculiar adaptation to private practice. The technique is as follows: The head of the bed should be raised about ten inches from the floor, and, to keep the mattress from sagging, under it should be placed, crosswise, several pine boards as long as the width of the bed. The mattress should be covered with a rubber sheet, upon which a pillow and ordinary sheet should be adjusted. The patient should be stripped and sprinkled with water of the

desired temperature from an ordinary watering-pot or from the irrigating apparatus, to the tube of which a sprinkling nozzle is attached. The water as it flows from the foot of the bed should be received in a large dish-pan or foot-bath, and can be used over and over, the proper temperature being maintained by the addition of ice. The water should not be poured from too great a height, and should be applied chiefly to the abdomen and legs. Rubbing with the hands should be kept up throughout the procedure, and otherwise the patient should be dealt with exactly as in tub bathing."

The *sponge bath* is the hydriatric measure most frequently employed in the treatment of typhoid fever. It has but little influence over the temperature, and that little depends upon evaporation and not upon the water *per se*. It has, however, a favorable action upon the skin, and is pleasing to the patient. The sponge bath consists of gently sponging the surface of one portion of the body after another, followed by brisk friction of the parts so treated.

*Ice water enemata* have been used for some time by Goodno in his service at the Hahnemann Hospital, as well as in private practice, with good results. This treatment, more than any of the others, has a marked influence over the fever, for it it is capable of lowering the patient's temperature 3° F. in half an hour. One to two quarts of ice water are injected high into the rectum by a fountain syringe, undue distention of the bowels being obviated by a return tube. This method is indicated especially in cases in which it is desirable to produce a rapid lowering of the fever. It should not be ordered in cases with intestinal hæmorrhage, because the cold stimulates the peristaltic activity of the intestines.

Fenwick's *ice cradle* is a substitute for the bath treatment, but has not been used extensively, convenient though it is. It "consists of an ordinary iron cradle sufficiently long to cover the patient in his entire length and broad enough not to limit his movements and thus prove irksome. Under this the patient lies, covered by some light and opaque muslin. Attached to the cross-bars of the cradle are small zinc buckets in which ice can be placed. The outer surface of the buckets should be covered with lint to prevent any of the condensed moisture from falling on the patient. The cradle is covered with a counterpane, excepting at the two ends, which are left open to allow of a constant interchange of air. A hot bottle should be placed at the patient's feet, and before the cradle is used he should be well sponged with tepid water"

**Medicinal Treatment.**—All statements to the contrary, medicines unquestionably exert a modifying influence over the course of typhoid fever. It is hardly likely, however, that any of them abort the disease. The multitudinous grouping of symptoms in patients with typhoid fever makes it highly improbable that we will ever find a specific remedy. In the early stages of the disease the symptoms are such as to limit our

choice to but few remedies, excepting as some one symptom assumes particular prominence and calls for special relief.

Three remedies are especially indicated in the early days of the fever, *i. e.*, during the first week, and these are *Gelsemium*, *Bryonia*, and *Baptisia*. Of these Bryonia is the one which deserves the most confidence. Its best results are obtained with the tincture or the first decimal potency, ten drops of which should be dissolved in four ounces of water. Of this solution one to two teaspoonfuls are to be administered every one or two hours. Its special indications include the general tired feeling, the universal aching of body and limbs, the white coating of the tongue, constipation, dry cough, stitching pains in the chest, and the initial epistaxis. The beneficial action of Bryonia is not confined, however, to the first week of typhoid fever, for its use may be continued throughout the course of the pyrexia, if the case progresses favorably, the bowels do not become more than ordinarily active, and symptoms indicative of other remedies do not arise. Even in the second or third week, it may be indicated by the dryness of the mucous membrane of the mouth, the general apathy, and a mild degree of subsultus tendinum. There may be a mental flightiness, not sufficiently severe to dignify by the name of delirium, in which the patient's mental obtuseness makes him believe that he is not in his accustomed quarters. Bronchitis or pneumonia complicating typhoid fever is also an indication for Bryonia.

*Gelsemium* is indicated in cases which present as their prominent symptom sensations of crawling or chilliness. The patient is more or less drowsy; the face presents a suffused redness; there is some muscular soreness, as with Bryonia; and there is prostration. If there is any discomfort in the head, it is not an actual headache, but a sense of fulness or expansion.

*Baptisia* was described not inaptly by Farrington as presenting about the same clinical phenomena as Gelsemium, but in greater degree of intensity. For many years it was regarded by some physicians as capable of aborting a case of typhoid fever. It is still regarded by many as an excellent remedy in cases presenting no special indications for other drugs. It is, however, far inferior to Bryonia as a remedy of general application to typhoid fever cases. It has a wider range of applicability than Bryonia in that it is more frequently indicated in the second and third weeks of the disease. The special indications for Baptisia include great prostration, aching and stiffness of the back and limbs, an indescribable feeling of faintness, vertigo, heat and flushing of the face, and a besotted appearance as of one intoxicated. The generalized bruised and sore feeling is not infrequently transmitted to the patient as a sensation as if the bed felt too hard, and this causes a certain amount of restlessness in his desire to find a comfortable way to lie. Headache is usually present, and is of a dull heavy character. The edges of the tongue are a deep red, and the balance of the

organ presents a white or slightly yellowish coating. Later in the course of the illness, Baptisia is indicated when the patient presents a low muttering delirium, sensitiveness in the right iliac fossa, and a moderate diarrhœa, with yellowish papescent stools. The best results from Baptisia have been obtained from the tincture, ten to fifteen drops of which should be dissolved in four ounces of water, and one to two teaspoonfuls of the solution given at hourly intervals.

With the beginning of the second week of the disease, other remedies than those above mentioned are useful. Those worthy of especial mention are *Rhus tox.*, *Phosphoric acid*, *Hyoscyamus*, *Stramonium*, *Hyoscine hydrobromate*, *Agaricus*, *Arsenicum*, *Cuprum arsenicosum*, *Arnica*, *Terebinthina*, and *Hydrastis*.

*Rhus toxicodendron* is indicated in cases of typhoid fever presenting a mild—at least not violent—delirium, associated with mental and physical restlessness. If, however, he is very much prostrated, this restlessness does not show itself. The patient is more or less stuporous, as evidenced by the slowness with which he grasps ideas and answers questions. Headache is severe, and is evidently congestive, for it is greatly relieved by nose-bleed. The association of pneumonia as a complication makes Rhus tox. all the more indicated. The breathing becomes difficult, and there is cough, with the expectoration of rust-colored sputum. The tongue is that which we find characterized of advanced typhoid conditions, namely, dark brown, dry, cracked, and ofttimes bleeding. Sordes, as an indicating symptom, is not of much utility, because these accumulations about the gums and teeth of patients in low exhausting diseases are rarely, if ever, found when the nurse is careful about washing the mouth of the patient. Diarrhœa is commonly present in the Rhus case. The stools are yellowish brown, very offensive, and often involuntary. Backache is commonly present, and is usually severe. Rhus has a special applicability to backache in typhoid, and may be prescribed as an intercurrent remedy for its relief when it becomes more than ordinarily severe. Subsultus tendinum and hallucinations are present in the more severe cases calling for Rhus. The best results are to be obtained from the use of the first decimal dilution.

*Phosphoric acid* has, as its chief indication, a profound apathy. Indeed, it may be administered with good results when that is practically the only characteristic feature of the case. Other symptoms calling for its use are nose-bleed—which, however, does not relieve head symptoms which may be present—distention and bloating of the abdomen, gurgling and rumbling in the intestines, and diarrhœa, with stools of watery character, or frothy, yellowish or greenish, and of gruel-like consistence, and containing undigested food. The tongue is dry, but pale, and not brown or cracked. Phosphoric acid is one of the remedies adapted to the urinary complications of typhoid fever, namely, nephritis and cystitis.

In cases presenting the marked sensorial apathy, and in which Phosphoric acid failed to bring about the desired result, Farrington recommended *Sweet spirits of nitre*, and believed he obtained good results from it.

The second and third decimal dilutions of Phosphoric acid are the usual preparations prescribed.

*Hyoscyamus*, *Hydrobromate of hyoscine*, *Stramonium*, and *Agaricus* constitute a group of remedies usually prescribed because of their relationship to the delirium which characterizes many cases of typhoid fever. Of these, *Hyoscyamus* is the favorite with the majority of physicians. It is successfully used in those cases of typhoid fever presenting an actively muttering delirium, associated with a generalized twitching of the tendons. The patient picks at the bed clothing or his lips, or grasps at imaginary objects in the air. The associated symptoms are such as we find in most severe cases of typhoid fever. Hyoscyamus is best administered in the first decimal dilution.

It sometimes happens that Hyoscyamus fails to bring the desired relief to the delirium. We may then resort to its alkaloid, *Hyoscine hydrobromate*, in the third decimal trituration, giving one tablet every hour until relief is obtained. Then the interval between the doses should be increased to four to six hours. While Hyoscine is an invaluable drug, and its use is attended by wonderful results, it must be employed with care. We should not use in typhoid fever the larger doses generally recommended for the relief of acute mania and delirium tremens. In some cases it has the undeniable effect of aggravating the delirium ; then it must be given in smaller doses or at longer intervals.

The type of delirium to which *Stramonium* is adapted is one not frequently observed in the course of typhoid fever, for it is of an active noisy kind, and takes the form of singing, active raving, the patient jumping from one subject to another without any logical connections. The case is one of unusual danger, and the patient exhibits a profuse perspiration due to exhaustion.

*Agaricus* was first used for the delirium of typhoid fever by the late Dr. Seth Pancoast, of Philadelphia. He prescribed the tincture, dissolving ten drops in two ounces of water, and giving one teaspoonful of the solution at two-hour intervals. The remarkable loquacity is its especial indicating symptom.

It sometimes happens, not often, however, that the usual remedies fail to relieve the delirium and restlessness of typhoid. The patient's abnormal, physical and mental activity is liable to exhaust him, and his heart. Palliation seems to be absolutely necessary in order to fulfill the indication of rest, so essential in the treatment of this disease. The selection of a sedative drug requires great care. Too often, we find the popular hypnotics of

the day prescribed. This is unfortunate, for they are not sure in their effects when administered in typhoid fever, unless doses beyond the realm of safety have been prescribed. In most instances, a few nights of quiet under the use of *Morphia* in doses not greater than one-quarter of a grain, and not repeated oftener than once in twelve hours, will be found the most satisfactory remedy. Chloral hydrate and Potassium bromide are too depressing in their effects on the heart, and should be administered only when the urgency for relief is great, and all other measures have failed. A delirious typhoid patient should never be left alone, for no one knows what he will do if he is relieved from the watchful eye of his nurse for even a short time. A few seconds only are sufficient for him to do much damage to himself.

*Arnica* is suited to typhoid fever cases in which changes in the venous circulation constitute the prominent feature. Passive congestion of the brain is present, as is shown by the drowsiness and apathy. The head is disproportionately hot to the body. The patient complains of a generalized bruised or sore feeling. Changes in the bloodvessels are made evident by the appearance of ecchymoses on various portions of the body. The pulmonary circulation becomes impaired and we have hypostatic pneumonia. The cough is attended by expectoration of mucus and blood. In still further advanced cases arnica may be indicated when the mental obtuseness has increased to the condition of apoplectic coma. The breathing is stertorous; urination and defecation are involuntary; and petechiæ appear upon the skin. Arnica is best used in from the first decimal to the third decimal dilutions.

*Arsenicum album* does not enjoy much of a reputation in the treatment of typhoid fever, mainly, in all probability, because the class of cases in which it is indicated are liable to die under any treatment. Fleischmann's advocacy of this remedy as a routine treatment of typhoid fever is certainly unwarranted, for there is nothing in common between its symptomatology and that of the disease as ordinarily seen. The indications for it include profound prostration, great restlessness, more or less stupor—usually more—hippocratic face, lips and tongue are dry and cracked, the color of the tongue may be black, great thirst, irritability of the stomach evidenced by vomiting of any and all nourishment, diarrhœa, the stools being watery or bloody, and possessed of an offensive odor; defecation and urination may be involuntary; the pulse is rapid, feeble or intermittent. The most satisfactory preparation is the third decimal trituration, one grain of which should be given every hour.

*Carbo veg.*, like Arsenicum, is indicated in cases in which hope is all but gone; hence it saves but few patients. Its symptoms are those of collapse. To quote Raue: "Stupor, out of which the patient can scarcely be aroused for moments; the eyes are dull without lustre, and the pupils without reaction to light; the hearing is gone; the face is pale, sunken, hippo-

cratic, cold; there are hæmorrhages from mouth and nose; the tongue is sometimes moist and sticky; other times parched, cracked and heavy, scarcely movable, bluish or pale; the pit of the stomach is bloated; the abdomen meteoristic, with loud rumbling and gurgling of wind in the intestines; there is colliquative diarrhœa, brownish, grayish or bloody, of a cadaverous smell, and involuntary. The cough has ceased, and the collected secretions cause loud rattling breathing, a sign of beginning paralysis of the lungs; the circulation is without energy; the blood stagnates in the capillaries and causes cyanotic blueness of the face, lips and tongue; ecchymotic spots here and there; decubitus; the pulse is extremely weak, frequent and small, scarcely perceptible; face and extremities grow cold, and become covered with cold perspiration—all signs of beginning paralysis of the heart; in short, the patient offers a picture of complete torpor of all vital functions, thus differing entirely from that of Arsenicum, which is always more or less associated with erethism of the system." Carbo veg. should be given in the 3x to the 12x trituration.

*Cinchona* is the remedy *par excellence* to be given during convalescence to restore the patient's strength. It is best given in ten-drop doses of the tincture every two hours.

Special conditions and symptoms may arise during the course of typhoid fever calling for special remedies or measures. **Headache** is usually not sufficiently severe to warrant any departure from the general measures in use. Occasionally, it may become a source of great suffering. *Belladonna* is probably the remedy which will bring about relief most frequently. In some cases, a few doses of the first decimal dilution of one drop each will prove all-sufficient, the medicines employed for the general condition being continued. When everything fails, four grains of Acetanilid combined with a half grain of Caffein citrate will secure relief. The latter prescription must not be used as a routine measure. The combination with the Caffein is essential because of the depressing effect of Acetanilid on the heart. I would not advise the repetition of the combination more than once, and then only after at least one hour.

**Intestinal antiseptics** are used by many physicians, the favorite of late years being *Acetozone*. A number of my friends have assured me that it gave good results. Personally, I fail to see how it can be of any value whatever; and the same remark applies to other intestinal antiseptics. Still it does no harm, and is permissible.

**Intestinal hæmorrhage** must always be regarded as a most serious accident in the course of typhoid fever. It is by no means necessarily fatal, for the majority of cases recover. I believe that the most rational course is to regard it as a mechanical condition and treat it accordingly. Certainly, it is not dynamic, excepting in the few instances in which the blood escapes by diapedesis. There is an opening into a bloodvessel, and

no dynamic measure is capable of stopping the bleeding. We must use drugs which act mechanically or chemically. I much prefer Opium to any other medicine. The particular preparation of this drug, the results from which have pleased me, is *Svapnia.* One grain of it should be given every hour while the patient is awake. As a rule, two doses are sufficient to bring about absolute quietness; and if the bleeding does not recur it should not be repeated until required. Opium acts as a splint to the bowels. It lessens their peristaltic action, and gives nature a chance to heal the wound. Ergot and its preparations have long been recommended by many authorities, the theory being that the vessels are constricted by it, and thus the opening through which the blood escapes is made smaller. But Ergot is open to the objection of exciting high vascular pressure, which is of itself sufficient to cause hæmorrhage when changes have taken place in the vascular walls. I fail, therefore, to see wherein it can do anything but harm. The internal use of Gelatin is harmless, and may be favored in conjunction with the other remedies. The patient should be given 10 to 12 ounces of a 10 per cent. of gelatin, by the mouth, in the course of the twenty-four hours. This substance acts by increasing the coagulability of the blood. Chloride of calcium has likewise been prescribed for the same reason. This drug has been recommended in very large doses, 20 to 30 grains every two to four hours. Its use does not impress me as altogether rational. In the first place, it takes some time to get up its full action, longer, indeed, than the urgency of the case will permit. Then, too, in typhoid fever, the hæmorrhage is dependent upon ulceration, and not upon diminished coagulability of the blood. Hence, the indication for Calcium chloride is wanting. There is some reason for fearing that it may do harm. By actual experiment it has been determined that the blood of typhoid fever is abnormally coagulable in many instances.

Clinical testimony in favor of the same fact is found in the frequency with which thrombosis occurs as a sequel of typhoid fever. It certainly will never do to give Calcium chloride as a routine remedy to lessen the frequency of intestinal hæmorrhage. Its administration may be sanctioned in the rare cases of hæmorrhagic typhoid, in which the bleedings are dependent upon changes in the vascular structures and composition of the blood.

With the onset of intestinal hæmorrhage the necessity of rest becomes all the more urgent. Even the exertion required to place the patient on the bed-pan may be dispensed with, and the evacuations passed on cloths or towels. Ice to the abdomen will act reflexly to cause contraction of the intestinal bloodvessels, and is a wise measure. Its action being local, there is no general increase in the vascular pressure. The best method of application is the Leiter coil. The internal administration of astringents seems to be based upon bad logic and ignorance of fundamental principles. Cer-

tainly, such substances as Monsel's solution and acetate of lead endanger the functional integrity of the digestive tract. When the hæmorrhage has been sufficiently great to cause fainting, the foot of the bed should be raised. If the collapse is not rallied from promptly, the physician should administer a normal salt solution by venous infusion, hypodermoclysis, or rectal injection. Owing to the necessity of prompt results, the former method is the best. If the emergency is great, a rapidly-acting stimulant, like Ether or Camphorated oil (*vide* Section on Heart Tonics), should be administered hypodermically.

Some objection may be urged against the opium treatment of intestinal hæmorrhage. It is well known that in about one-fifth of the cases of intestinal hæmorrhage that symptom is but the precursor of perforation. Opium, therefore, is not unlikely to disguise the one symptom upon which we can depend for our diagnosis of that accident. While the objection is unquestionably one deserving of respectful attention, it may be disregarded in most instances, especially if the physician orders but limited doses of the analgesic, as above advocated.

The remedies to be prescribed in cases of intestinal hæmorrhage include *Hamamelis*, *Terebinthina*, *Hydrastis*, and *Ipecacuanha*.

**Intestinal perforation** calls for but one treatment, namely, laparotomy and closure of the opening. The difficulty lies not so much in the doing, as in knowing when to do it. In other words, the important problem is the diagnosis of the perforation at the earliest possible moment after it has occurred. Text-books and teachers have long been telling us of certain classic symptoms diagnostic of perforation; but, unfortunately, said symptoms are the clinical evidences of peritonitis, and do not appear until the case has passed beyond the help of surgery. Late operations bring bad results and discredit the surgeon. Still, no case should be abandoned unless moribund or with signs of circulatory failure, which make recovery almost impossible.

The majority of typhoid perforations take place in the last twelve inches of the ilium. The most important symptom of perforation is pain, situated in the right side. It is associated with tenderness on palpation, rigidity of the right rectus abdominalis, and *possibly* some shock. In most cases it has been preceded by intestinal hæmorrhage. A very early sequential symptom is a leucocytosis. This coterie of symptoms should make the question of exploratory laparotomy well worthy of consideration. Of course, if we find limitation of the respiratory movements, especially in the hypogastric region, and clinical evidences of free gas in the abdominal cavity, impaired peristalsis, all the better for the diagnosis; but *we should never wait* for collapsic temperature, abdominal distention, hippocratic countenance, quick, filmy pulse, hiccough, and profuse cold perspiration, *all of which phenomena are surely indicative of a fatal peritonitis.*

Really, the greater danger in a laparotomy performed on a typhoid fever patient is the anæsthetic. In case of an assured diagnosis of perforation this counts for nothing. But when there is a strong probability of perforation, and the patient's temperament and nervous condition is such as to make such a procedure feasible, an exploration may be performed under cocaine anæsthesia. If perforation is discovered, the physician can use his judgment as to general anæsthesia or going ahead without it; if perforation is not found, the wound may be closed without delay.

**Cardiac failure,** or, more properly speaking, cardiac weakness in typhoid fever is too often apparent and not real. While it is of the highest importance to watch for signs of a failing heart, we should make sure that such a condition is present before resorting to stimulation. There can be no question as to the fact that stimulation by strychnia and other remedies in typhoid fevers and other diseases is overdone, ofttimes to the detriment of the patient. Alcohol is, as we have previously stated, a most excellent stimulant, and is the first one to be employed. Before proceeding further with stimulation, it is wise to determine first whether the heart is failing or the blood-pressure is too low. In typhoid fever low blood-pressure is present regularly. If it goes to a dangerous extreme it must be corrected. If it is determined that diminution of the blood-pressure is the fault, then we should resort to agencies to correct it. Of these, hypodermoclysis with normal salt solution is the first remedy, or, if a prompt effect is desired, venous infusion of the same. We may also give three-grain doses of suprarenal extract three times daily. We must observe care that we do not overdo the matter, lest we throw undue labor on the heart.

The administration of drugs whose physiological action is to lower blood-pressure must be avoided. Of these, Glonoin is the one most frequently abused. Under no circumstances should this drug ever be used as a circulatory stimulant in typhoid fever.

When it is actually determined that the heart is at fault we may, when necessary, resort to cardiac stimulants. Of these, Caffein citrate, in doses of one grain every four hours, is the best. Strychnia sulphate may be used in doses of one-sixtieth of a grain hypodermically every four hours. But the Caffein is decidedly the better of the two. Remember, that it is important to bear in mind that the heart is failing because it is structurally weak. Stimulation of such a flagging heart must be performed with discretion and skill. Digitalis is to be condemned.

**Constipation** is an occasional source of annoyance in the treatment of typhoid fever. Usually, the early administration of Bryonia conduces to regular action of the bowels. When, however, the bowels show a tendency to go more than two days without action they should receive attention. The best remedy is an enema of salt solution in the proportion of one tablespoonful to the quart. At first but a pint should be given. If it

succeeds, this quantity should be continued on subsequent occasions. If it fails, the full enema must be given. If, for any reason, the bowels become locked up for a prolonged period, as after intestinal hæmorrhage, and an evacuation becomes difficult if not impossible, repeated enemata of water to soften the fæcal masses may be tried. These failing, eight ounces of olive oil may be injected into the rectum and permitted to remain. In the course of a few hours this succeeds in securing a fairly easy stool.

Severe **diarrhœa** finds a very efficient remedy in *Cuprum arsenicosum* 3x, two tablets every hour. If it fails, *Tannigen* in five grain doses may be administered every two hours. A moderate diarrhœa is not an unmixed evil, for it acts to carry off toxic substances.

**Meteorism** when extreme, and is of itself a great source of suffering, may be relieved by the use of the rectal tube. If this fails, the soft rubber tube should be passed well into the colon. Puncture with a hypodermic needle is never justified. Ordinarily meteorism may be relieved promptly on its first appearance by taking away practically all food for 12 to 24 hours, after which the patient should be fed with greater discretion than heretofore. The internal remedy best adapted to this condition is *Terebinthina.* We may also use turpentine externally. A piece of flannel is wrung out in hot water, and then sprinkled with a tablespoonful of turpentine and applied to the abdomen. It is kept there sufficiently long to excite a bright redness of the surface.

Other remedies than Terebinthina suitable for the abdominal distention include *Cinchona, Carbo veg.*, and *Strychnia.*

**Cholecystitis** must be accepted as a surgical complication of typhoid fever. The necessity for prompt action is by no means as great as in the case of intestinal perforation. Still, the local pain and tenderness with rigidity should receive careful consideration, especially if associated with distended gall-bladder. The danger of perforation of the gall-bladder in these cases is not inconsiderable, being generally estimated at about 20 per cent. A distended gall-bladder is an indication for operation. Temporizing operation, as paracentesis, is pernicious practice, and should never be performed.

**Epistaxis** is scarcely ever sufficiently severe to demand much consideration. In many cases it seems to bring relief to the head symptoms. As a rule, it ceases spontaneously in a short time. Should it be persistent, the nasal cavities must be inspected most carefully, and the bleeding point determined. Pressure can then be made thereon, and the hæmorrhage stopped. If the seat of hæmorrhage is not accessible for this, measures recommended in the section on Epistaxis should be practised. The remedies indicated in epistaxis are *Hamamelis, Erigeron, Ipecac, Belladonna* and *Cinchona.*

**Delirium** calls for the application of the ice-bag to the head. Hypo-

dermoclysis and other means for administering large quantities of water must be enforced. If the patient cannot be kept in bed, the restraining sheet should be applied; or a piece of board should be fixed to the side of the bed. Remedies include *Hyoscyamus*, *Stramonium*, and *Rhus*. If a physiological anatagonist to delirium is required, it had better be Morphia, but its action should be carefully watched. It never should be given in combination with Hyoscine.

**Bed-sores** are to be prevented by attention to details as to cleanliness, keeping the bed linen smooth and free from foreign substances, and change of position of the patient from time to time. It is seldom necessary to use a water-bed. If undue pressure is maintained on special portions of the body, local bathing with alcohol and alum will lessen the tendency to formation of bed-sores. When a bed-sore has once developed it should be treated on surgical principles only. It must not be regarded as an occult lesion, for which some peculiar treatment is to be tried; but it must be treated by antiseptic measures, as bichloride irrigation, aristol, and gauze dressing.

The **urinary complications** are practically always dependent upon the invasion of the urine by the typhoid bacillus. Pyuria is common, and has been known to continue for many years after recovery from the primary disease. In most cases the ordinary remedies, to be mentioned in a subsequent chapter as useful for acute nephritis and pyuria, will be sufficient. In the cases which refuse to yield to ordinary treatment we may have recourse to *Urotropin*, which is eliminated by the urine as a weak formalin solution. The dose is seven grains three or four times daily. While this drug is an excellent urinary antiseptic, it has been over-rated, for it is not capable of curing all cases of pyuria, typhoid in origin and otherwise. If the pyuria is distinctly vesical, it may be necessary to wash out the bladder with a weak boric acid solution. These special measures for the pyuria are not to be put in force until the patient has fully recovered from his typhoid fever. In the case of nephritis it is different, as this is frequently a dangerous complication, and must be taken in hand at once. If, at the time it becomes manifest, the patient is taking alcoholics it is important to cease their use, if it is possible for the patient to get along without them. The free use of a good spring water becomes of paramount importance. If the urinary flow is decidedly small, salt water hypodermoclysis or venous infusion is invaluable.

Retention of urine sometimes takes place. It usually requires the catheter. In such cases, the little operation of catheterization should be performed with close attention to antiseptic technique.

Falling out of the hair is a very common sequel, but should occasion little concern. As a rule, the hair comes in again when the patient regains strength. In those cases in which the hair bulbs are destroyed nothing

will do any good. Fortunately, these are greatly in the minority. With this statement of the facts, the reader will readily infer that shaving of the head is a senseless procedure. It is unnecessary if the hair bulbs are not affected, and it is useless if they are. Local applications of a stimulating character are useful in hastening recovery. For these the reader is referred to the chapter on cutaneous therapeutics.

The appearance of small abscesses on the skin always calls for energetic action. Their discharge is capable of infecting other portions of the skin. Internally, Hepar 2x, one tablet every two hours, is the best remedy. At the same time local antiseptic treatment must be instituted. Each abscess must be treated by an application of pure carbolic acid on the point of a fine probe after opening. Early opening is important. Then the affected part must be covered by antiseptic gauze.

**The Management of Convalescence.**—Two points are of importance in the management of the patient convalescent from typhoid fever, namely, rest and feeding. The convalescent period dates from the time the temperature reaches the normal point. For the first week after this time, it is of the highest importance that the rigid attention paid to physical and mental rest during the course of the fever shall continue in force. Company must be rigidly enjoined, for it is not uncommon to observe a return of fever after the excitement attendant upon the reception or entertainment of a visitor. If everything goes well, the patient may be permitted to sit up in bed for half an hour. This may be repeated, or the time lengthened, later in the day, if the experiment has proved a success. Two or three days later the patient may be permitted to sit in an easy chair for one hour. From this time on, the period during which the patient is permitted to leave the bed is lengthened. The indulgence of increased liberties is to be graded by the influence of sitting up on the pulse and temperature. It sometimes happens that the stay in bed causes a nervous condition which maintains a temperature slightly above the normal. This was described by DaCosta as "the bed fever." When this condition is suspected, it does not do to wait until the temperature subsides to the normal point before allowing the patient to sit up. The many weeks of low diet likewise tend to perpetuate the fever in some cases. In these, we must likewise start in to feed, despite the usual rules for the feeding of convalescent typhoid patients.

When the temperature reaches the normal, we should enlarge the patient's diet list. This must be done with care, ever mindful of the fact that indiscretions may cause damage to the intestinal lesions. Physician and nurse alike find it difficult to control the patient at this time, for his demands for solid food are often piteous to an extreme. The articles of diet permissible should be at first certain semi-solid foods. On the first day we may allow the broths to be thickened with thoroughly boiled rice; or he may

be given a piece of milk- or cream-toast. On the second day the same articles should be ordered, but he is not to be limited to once in the day. On the third day he may be given junket, a soft-boiled egg, or a baked custard. By the fourth day the dietary may be still further extended by giving him the bellies of, say, four oysters, in addition to the articles already permitted. By the fifth day he may take sweetbreads, bread and butter, a poached egg. One week after the subsidence of the fever he may be given a small piece of tenderloin steak or white meat of broiled chicken, mush and milk. After this period it is of more importance to look after the quantity of food taken, as the craving for food makes it a very easy matter to overload the patient's stomach. Throughout the course of convalescence we are obliged to keep a watch lest we run into one of two dangers: unduly starving the patient on the one hand and prolonging the period of exhaustion, or of feeding him too heavily, and thereby occasioning a relapse, on the other.

After the end of the second week we have but little to fear. We are thereafter engaged in building up the patient's strength and enabling him to put on flesh. This, at the best, is a slow process. When the finances of the family will permit, a stay at the seashore or mountain resort will do much. Once in a while we meet with cases in which the wonted health is not restored for several months.

**The Post-Typhoid Spine.**—After reviewing the opinions of various authors as to the nature of typhoid spine, Gibney* states that he has had fairly good results in its treatment by resorting to fixation of the spinal column, the avoidance of trauma, the free use of the Paquelin cautery, and the subsequent employment of well-directed massage and graded exercises.

The value of the cautery as a counter-irritant has proven so valuable in his hands that he feels justified in recommending it above all other counter-irritants. The plaster-of-Paris jacket or corset has not proved so valuable as the simple Knight spinal brace or the posterior spinal assistant of Taylor. The criss-cross strapping with zinc oxide plaster has been a valuable adjunct, especially in the milder forms of this disease. Potassium iodide has been given in certain cases, but not with any definite results. Where deformity exists, as it undoubtedly does in certain instances, it is necessary to wear apparatus for longer periods. In view of a destructive process going on in the bodies of the vertebræ, the remarks made by McCrea in his conclusions, namely, the similarity of the process to that in arthritis deformans, are quite suggestive, and it may be well to call attention to the value of immobilization in cases of arthritis deformans rather than the methods so commonly employed of massage, shampooing, electricity, etc.

The hypodermic administration of *Carbolic acid* (*vide* article on Rheumatic Fever for details as to technique) should prove of considerable value.

* *N. Y. Medical Journal*, April 20, 1907.

## Typhus Fever.

Typhus fever is a highly contagious disease, and this fact must be kept in mind constantly when patients suffering from that malady are under our care. Contagious though it is, and little as we know respecting the specific micro-organism at work, we can, by following the ordinary rule governing the management of contagious disease, stamp out an epidemic in a very short space of time.

Early and thorough isolation of the patient is our first duty. We may be more emphatic, and say that during epidemic times we should so treat every patient whose illness can possibly be typhus fever as such, until future events have proven otherwise. This may inconvenience the patient and his family, but it does no harm, and occasionally such a policy may mean the saving of many lives. In no disease is the danger of transmission to physician or nurse so great as in typhus fever. As it very rarely attacks the same person a second time, it is very important that a nurse who has thus been immunized be secured, if possible. This can seldom be done, because cases of typhus fever do not come singly, and the demand for immune nurses always exceeds the supply. Fortunately, the danger of contracting the disease is in direct ratio to the concentration of the poison; that is to say, the poorer the ventilation, the longer the time of the exposure to contagion, and the nearer we approach to the patient the greater is the danger of taking the disease. Murchison, referring to the latter point, remarks not inaptly: "The striking distance of typhus fever is not great."

The room selected for isolation of the patient must be on the top floor. It must be well ventilated, and sufficiently large to give 2,000 cubic feet for each person therein. If the means of the patient will not permit this, he must be removed to a special hospital. All curtains, carpets, rugs, and upholstered furniture must be removed from the room. After the termination of the illness, such of the bedding as is incapable of certain disinfection, *e.g.*, the mattress, should be burned. Sheets, towels, etc., must be subjected to prolonged boiling. Throughout the course of the illness, no one must be permitted to enter the room. The nurse must not be permitted to mingle with others in the household. Food and articles needed for the care of the patient should be brought to the outside of the sick-room and left where the nurse can get them. The nurse must have a separate room, where she can retire for rest.

To make the room habitable after termination of the case, it and everything it contains should be disinfected by formaldehyd vapor or sulphurous acid gas. To do this, the windows are all tightly closed, any cracks stopped by packing with pieces of rags. The door is closed, the key-hole and the crack below packed. Formaldehyd is to be used in one of the generators sold in the surgical supply shops. To disinfect by sulphurous acid, take four pounds of sulphur for every 1,000 cubic feet of air space in

the room, and burn it in a metal receptacle. The room must be exposed to the fumes for not less than twelve hours. Then it should be ventilated thoroughly, and all of the woodwork about it well scrubbed down with a mercuric chloride solution in the proportion of one to a thousand.

The predisposing causes of the disease are found in the poorer sections of a community. They are believed to be bad air, poor and insufficient food, and intemperate habits. It therefore behooves the healthy to lessen their chances of contagion by living in well-ventilated apartments, eating regularly of food of good quality, and avoiding alcoholic beverages.

Ventilation of the sick-room is regarded by those who have had experience with typhus fever as of such extreme importance that they advise plenty of fresh air blowing about the patient, even in winter time. When possible they have even had hospital tents constructed. To the uninitiated, such a course may seem dangerous as liable to excite "colds," or bring about a bronchitis. Practically, it has been noted that while bronchitis and pulmonary congestion are included in the pathological changes observed in patients who have died of typhus fever, such lesions are greatly benefited by abundance of fresh air. More than that, the disease when treated in well-ventilated apartments or wards always runs a much milder course than do others not so placed.

Advice to put the patient to bed early in the course of his illness is unnecessary in the case of typhus, for he feels so badly from its initial symptoms that he goes there at once voluntarily.

The nurse should see to it at once that the patient's head is kept cool and his feet warm. To this end cloths wrung out in cool water or the ice-bag should be applied to the head, and the feet well wrapped in woolens or kept in contact with hot-water bottles.

As in all fevers, the diet must be liquid. Milk constitutes the ideal food. We are, however, permitted to prescribe a greater variety than in typhoid fever, for the patient may take eggs, broths, arrowroot, sago, bread and milk, tea and coffee. He must be fed regularly every three hours, unless he is sleeping quietly and has been more or less restless or flighty. If, on the other hand, he is stuporous, he should be awakened for food. The nurse may even give him a cup of strong black coffee under such circumstances. If his digestive powers are weak, it is well to confine the diet to milk. If that seems to disagree, it should be peptonized or mixed with one-third of its bulk of lime water.

If diarrhœa is present, the milk must be boiled.

The regular administration of water is of the highest importance. Its free use is certain to modify the course of the disease in a favorable manner. If desired by the patient, ice may be administered freely.

The practice of ordering alcohol as a routine measure—so commonly in vogue in former years—is not to be countenanced. The same rules

which govern its administration in typhoid fever apply in typhus. The symptoms which indicate it are, however, more likely to occur in typhus. It is also a good working rule to order the alcohol when in doubt.

The best cardiac stimulant in typhus fever is camphorated oil. A 10 per cent. solution of this drug in olive oil is prepared. Of this from 15 to 30 minims are given hypodermatically. Its action is very evanescent; hence, it should be repeated frequently, in extreme cases as often as every twenty minutes.

The bowels must be kept regular. All excreta must be disinfected with the same care as in typhoid fever.

The patient's mouth must be carefully and thoroughly cleansed after every feeding. For this purpose nothing is better than listerine or glycothymoline diluted with an equal quantity of water. Boric acid is also an excellent buccal antiseptic.

Special measures may be required to relieve certain conditions which may arise. Meteorism may occur, as in typhoid. As a rule, the same measures which relieve the constipation serve to prevent its onset or cure it when present.

Attention to the bladder is of importance, for not infrequently there is paralytic retention or incontinence. In case of dribbling of the urine it is of importance, as in all low fevers, to make sure that such incontinence is not due to a greatly distended and overflowing bladder.

**Headache** is efficiently relieved by cold applications to the head.

If the patient is sleepless he should be kept quiet, all noises excluded from the sick-room as much as possible, and he may be given a tepid sponge bath. In some cases the hot wet-pack is an efficient quieting agent. Hypnotics are, as a rule, not advisable. Those which are in most favor are *Sulphonal* and *Urethane*.

**Thrombosis** should be treated by the raising of the affected extremity, usually a leg, to favor the return circulation, and the application of bandages soaked in glycerin along the course of the affected vein. In place of the latter, a preparation of kaolin and glycerin, known pharmaceutically as antiphlogistin, should be of value.

The venous infusion of normal saline solution is indicated in collapse, or when the body has been dehydrated by profuse diarrhœa. The depurative action of water may be obtained by high colon enemata of normal salt solution.

Hydrotherapeutic measures are more important in the treatment of typhus than in typhoid fever. They are, morever, closer identified with the direct reduction of temperature than in the latter disease. One method recommended has to do also with the promotion of oxydation of the toxins in the body. This consists in the injection into the bowel of oxygenated water (10 per cent.) at a temperature of 59° to 68° F. As Bouchard says,

this burns the toxic substances in the tissues by supplying them with an abundant quantity of oxygen. The value of this method is attested by the greatly lowered toxicity of the urine of patients thus treated.

Bathing is another valuable method of regulating the fever. It may be employed as the continuous tepid bath or by the Brand method. In the case of the continuous tepid bath, the patient is placed in the tub, the water being at a temperature of 88° F., and he is kept there for a period of twenty-four hours. Another method, advised by Ziemssen, is to place the patient in a bath from 9° to 36° F. below that of his bodily temperature, and keep him there until he begins to feel chilly, when he is removed.

The Brand method is followed exactly as in typhoid fever.

The baths should be repeated at intervals of three hours.

The reduction of temperature in typhus by means of the antipyretics is not to be countenanced.

As to the medicines to be employed in the treatment of typhus fever, very little of a practical character can be said, because present-day literature is almost silent on the subject, while that of former years is rendered valueless by the general confusion of typhus and typhoid fevers. Notwithstanding the symptomatic similarities of the two diseases, it is hardly likely that the medicinal treatment of the two affections can be said to be identical, because there are too many underlying differences as to the pathological explanations of their origin.

*Baptisia*, unquestionably on symptomatic grounds as well as because of its intimate relationship to general toxæmia, should occupy the first place as a remedy. It is best used in the tincture and first decimal dilutions. It is especially recommended by Hughes as the remedy for the initial stage.

For the cases characterized by intense headache, *Belladonna* is well adapted, not only symptomatically, but because of its applicability to cases of cerebral congestion in general.

*Hyoscyamus* and *Stramonium* are to be used in the cases characterized by delirium. The *Hyoscyamus* case is one accompanied by more or less adynamia.

*Opium* is suited to cases characterized by torpor or stupor.

Drysdale and Simmons have found *Agaricus* useful in cases associated with restlessness, twitching and tremor.

Wurmb, Bähr, Jousset and Trinks, recommended *Phosphoric acid* in cases presenting great nervous depression with but slight febrile excitement or signs of blood-poisoning. In their opinion of this remedy in this class of cases they are endorsed by numerous old-school authorities.

*Phosphorus* is suited to cases in which the pulmonary symptoms are prominent. It is also adapted to the myocardial degeneration of typhus and other low fevers.

Cases presenting a high degree of toxæmia call for *Muriatic acid*, *Rhus tox.*, and *Arsenicum.*

Russell successfully used *Mercurius biniod.* in one case presenting inflammatory swelling of the salivary glands and the areolar tissue about the neck.

The testimony of the value of homœopathic treatment in typhus fever is limited, owing to the few epidemics in which the physicians of our school took an active part. Early reports, as already stated, must be excluded, because of the confusion of this disease with typhoid fever by the physicians of both schools of medicine. In the London epidemic of 1864, thirty cases were treated with a loss of but two. One patient died of uræmia, the other of cellular inflammation of the neck. No uncomplicated case died. This makes a mortality of 6.6 per cent. This is a good showing, because the old-school statistics range from 10 to 50 per cent.

The treatment of the period of convalescence calls for conservatism. The restoration to health is rapid, and the patient presents a ravenous appetite, which must be curbed. While he must have a good supply of food, it should be selected with care as to its digestibility and proper cooking. The quantity must be increased gradually despite the demands of the patient for more.

The weakened condition of the heart makes it necessary for care in getting the patient out of bed, lest we precipitate an alarming syncope.

## Relapsing Fever.

An understanding of the etiological factors of relapsing fever is essential to a proper enforcement of prophylactic measures. The presence of a specific micro-organism, the spirillum of Obermeier, in the blood, is recognized as the specific cause. Before it can be operative or find lodgment in the human body certain predisposing conditions are necessary. These, so far as we can judge by practical conditions, are brought about by overcrowding, lack of food, improper food, bad ventilation, and filth. The disease is undoubtedly highly contagious, and yet those who live under proper hygienic surroundings are decidedly less liable to take it. As in typhus fever, the extent of exposure has some bearing on the liability to infection, as shown by the comparative frequency with which physicians and nurses go down with the disease.

With the appearance of an epidemic, therefore, it is important that all crowded and dirty tenements and alley-ways reeking with filth be thoroughly cleansed. The denizens of such places should not be permitted to overcrowd them; and they must be supplied with pure water and food of good quality. Prisons, lodging-houses of the slums, wayfarers' boarding-houses in particular, demand attention. In view of recent discoveries demonstrating an intimate relationship between certain insects and the spread of

infectious diseases, vermin must be exterminated, and flies and other insects in the sick-room destroyed.

The class of patients liable to be taken with relapsing fever is such that they can receive but little proper attention at home. Prompt removal to a suitable hospital is, therefore, advisable. If, however, they are treated at home, all the measures advocated in the article on typhus fever should be instituted, and with the same sedulous care. If the patient is removed to a hospital, the dwelling whence he was taken must be thoroughly cleansed and disinfected.

Relapsing fever being due to a specific micro-organism, it is natural that efforts directed to its cure by agents capable of causing the death of the spirillum of Obermeier should have been made. In test tubes various substances have been capable of bringing about this result. For example, quinine does it in the proportion of 0.1 per cent.; iodide of potassium in 0.05 per cent.; strychnia in the proportion of 8 to 100,000; carbolic acid in 0.1 per cent.; calomel in 0.03 per cent.; mercuric chloride in 0.0033 per cent. Clinical observations have demonstrated that none of these drugs can be introduced into the human body in sufficient quantities to bring about practical results, unless it is iodide of potassium. This has been tried by Popoff in doses of five grains, three times daily, without any effect whatever on the course of the disease. It is, of course, impossible to say what would have happened if it had been given in the large doses commonly in use in the treatment of nerve syphilis. As matters stand at present, we are obliged to confess that we are without a specific treatment for relapsing fever.

Homœopathic literature shows that we have accomplished something in the treatment of relapsing fever. Hahnemann himself, in the Leipsic epidemic of 1814, treated 183 cases without a death. The mortality under old-school measures has varied all the way from 2 to over 50 per cent. Kidd treated 87 cases, in 1847, with no death. Dyce Brown, in 1871, treated 50 cases, likewise without a death. This makes a grand total of 320 cases with results ideal as to the death-rate. The remedies employed were mainly *Bryonia*, *Rhus tox.*, and *Baptisia*. It does not seem to have been claimed for these remedies that they prevented the occurrence of relapses, but rather that they expedited the crisis and caused the fever to run a milder course. Because of its relation to fever associated with severe pains (break-bone fever) Hughes recommended the trial of *Eupatorium perfoliatum*. The same authority on theoretical considerations mentions *Aconite* as a therapeutic possibility. Dyce Brown dissents from this, saying that it is useless. Old-school physicians have used the remedy in one drop doses of the tincture every two hours, and have alleged good results from its employment.

Special measures, *e. g.*, hydrotherapy, for the reduction of the pyrexia,

do not seem to be advisable, for it has been noted that the spirillum does not thrive well in the presence of high temperature. In fact, Heidenreich claims that the termination of the paroxysm is due to the high temperature which occurs before the crisis. On the other hand, it must be admitted as conceivable that hyperpyrexia may exert a deleterious influence on the tissues of the body as well as on the micro-organism, and may thus, of itself, become a special menace to life.

Cases of relapsing fever exhibit an unusual tendency to heart failure. During convalescence, it sometimes happens that a case that is apparently doing well dies suddenly in consequence of some slight exertion. This constitutes a warning to us to conserve the patient's strength as far as possible by a system of rigid rest. The best cardiac tonic in relapsing fever is alcohol in the shape of one of the wines. Camphorated oil may also be used, as in typhus fever. Ether, hypodermically, is needed when an unusually prompt action is required. It would seem, however, from the data obtained by actual experience that stimulation, excepting with wine, is rarely, if ever, necessary. Still, as one never knows what sort of a patient he may have, or how much his constitution may be undermined, it is well to be ready to make vigorous stimulation when circumstances require it.

In the selection of a diet for the relapsing fever patient, the necessity of one that is easily assimilated and highly nutritious must be borne in mind. Milk, of course, as in other fevers, should be the fundamental nutriment. To it may be added eggs, rich broths, beef-juice, tender meats, the lighter and more easily digested vegetables, etc.

The complications of relapsing fever include pneumonia, hæmorrhages, and diarrhœa, all of which should be treated on symptomatic indications.

## Yellow Fever.

**Prophylaxis.**—With the discovery that the transmission of yellow fever from the sick to the healthy could take place only through the medium of one variety of the mosquito—the *stegomyia fasciata*—the prevention of the spread of the disease became a comparatively easy matter. Two factors are necessary to the propagation of the disease, namely, a case of yellow fever and, secondly, the presence of the above-mentioned variety of mosquito. Moreover, it is essential that these come together before the disease can be spread. Destroy the mosquito, isolate the yellow fever patient and keep him from mosquitoes, and the problem of yellow fever prevention is solved. This has been done; and, as the result, we have the city of Havana, where yellow fever has been endemic for over a century, entirely free from the disease.

In describing the methods for carrying out the necessary factors in the prevention of yellow fever, I cannot do better than to describe the methods

pursued by Major Gorgas,* under whose supervision the work of extermination was carried out in Havana:

The mosquito, as is well known, has its favorite *habitat* about pools of stagnant water, breeding even in cans and other receptacles where such water can be found. An ordinance was issued requiring all people within the city limits to keep all receptacles containing water mosquito proof. Inspectors were appointed for numerous districts throughout the city to see that this ordinance was enforced. He was accompanied by men with oil-cans to pour oil in all cesspools, puddles, etc., about dwellings. All receptacles in which larvæ were found were destroyed. All pools and low grounds were drained, and oil (petroleum) was poured into such places as could not be drained. While these procedures did not entirely get rid of mosquitoes, they greatly limited their number and lessened the danger of infection in direct ratio.

The next proposition was to stop the stegomyia from biting infected subjects. This was done by providing the windows and doors of all hospitals with mosquito-screens. Patients themselves were surrounded by mosquito-netting.

Lastly, it was necessary to kill all mosquitoes which had been infected by contact with the sick. This was done by the use of pyrethrum powder in the infected and adjacent buildings. This was done on a very liberal scale, so that 150 pounds of the powder were used on an average in each case. Pyrethrum was selected, not because it was the best mosquitocide, but because it was efficient for the purpose, and inconvenienced the occupants of the dwellings the least. It does not injure fabrics, and the apartments in which it has been used can be occupied within five or six hours. It does not kill all the mosquitoes. Some are merely intoxicated. It is necessary, therefore, to sweep up the floors and walls thoroughly, and destroy all the sweepings by fire. Formalin vapor is probably more effective in killing the mosquitoes, but inconveniences the residents to an unnecessary degree. Every room in the infected dwelling and its neighbors must be gone over in this manner. One pound of pyrethrum was used for each 1,000 cubic feet of air space rendered harmless.

Non-immune individuals in a fever-stricken community can make themselves comparatively safe if they but bear in mind the habits of the stegomyia fasciata. This mosquito usually rests during the middle of the day; hence there is but little danger from it between the hours of 9 A.M. and 3 P.M. After the latter hour the non-immune should take themselves to high ground and protect themselves behind mosquito-screens. If they must go about the infested localities, they should wear netting over their heads and heavy leggings and gauntlets. Protection by anointing the skin with various essential oils is not sufficiently reliable to be practised.

* *The Lancet*, 1902, vol. ii, p. 667.

The discovery of the *rôle* of the mosquito in the production of yellow fever made many of the measures previously employed as preventives supremely ridiculous. Experiments have proven conclusively that the disease cannot be carried by fomites, soiled though they be by the vomit and the fæcal discharges of patients. As a matter of cleanliness, such articles should be destroyed as useless. Their disinfection is necessary only as a means of ridding them of any concealed mosquitoes.

Ships from infected ports are to be disinfected by burning sulphur in their holds, that all mosquitoes concealed therein may be destroyed. Ships in harbor can make themselves safe from infection by anchoring one-half mile from the shore.

Nurses and others attendant upon the sick should not associate with well persons, lest they carry with them infected mosquitoes.

The danger of infecting mosquitoes is particularly great during the first three days of the disease. Ambulant cases of yellow fever are especially dangerous to a community, because they go about without any protection. It is currently believed that they, more than any other class of cases, are responsible for the spreading of an epidemic.

In arranging the sick-room, special attention must be paid to doing away with any places in which mosquitoes can find refuge.

**Treatment of the Patient.**—Special measures directed to the reduction of the fever are not advisable. Baths tend to do more harm than good, for they not infrequently give rise to visceral congestions, one of the sources of danger to yellow fever patients. In some few cases, in which the hyperpyrexia of itself seems to be a source of danger, resort may be had to cold enemata; but such cases are exceptional. Sometimes cold applications may be made to the head, and the extremities may be sponged with cold water if grateful to the patient. Cerebral congestion may be relieved by hot mustard water foot-baths.

Various visceral congestions may be relieved by application of hot poultices over the affected organ. They are far more efficient than the ice-bag. A hot poultice over the epigastrium ofttimes relieves nausea, gastric distress or pain, and vomiting. In a similar way disturbance of renal action may be relieved by an application to the loins.

Rigid rest is required in all cases, even the mildest. Experience has taught that the earlier the patient takes to his bed and the more rigidly the rest is enforced, the better are the results. Under no circumstances is it permissible to move the patient after he has been properly housed and put to bed.

Yellow fever patients are best fed on nothing for two or three days, *i.e.*, until the period of calm supervenes. Then they may be given liquid food in very small quantities—about one drachm. The articles to be administered first should be chicken water, iced milk, milk and barley water,

etc. If prostration is extreme and starvation does not seem advisable, the patient should be fed by the rectum.

The urinary excretion must be carefully watched ; indeed, it is the duty of the nurse to measure it after each micturition, and at the same time make one of the rough tests for quantitative estimate of albumin. The daily quantity of urine, however, is the important desideratum, a patient who is passing from 500 to 1,000 c.c. of urine usually being regarded as in a safe condition.

Stimulants are not, as a rule, called for until after the fourth day. They should be given in small quantities at very short intervals. Blair, who has had a large experience in the treatment of yellow fever, was a strong advocate of Rhine wine, giving as much as two quarts in the twenty-four hours. A good dry champagne is another excellent stimulant. Some authorities prefer it to all others. One-half ounce is given with ice every two to four hours. General experience is against the administration of the stronger alcoholics excepting in the case of habitual drinkers.

The homœopathic physicians of the South, who have had a large experience in the treatment of yellow fever, report most excellent results. Falligant, of Savannah ; Holcombe, of New Orleans ; and Orme, of Atlanta, have made a good showing for our school.

Falligant had a mortality of 32 in over 900 cases. The milder types "yielded readily to *Aconite* and *Belladonna* tinctures in watery solutions of five drops to a tumbler of water, given in tablespoonful doses in hourly alternation—warm mustard foot-baths being additionally employed to facilitate transpiration. In some cases, *Arsenicum*, *Ipecac*, *Merc. sol.*, *China*, *Nux vomica*, *Rhus tox.*, and *Sulphur* were found useful in relieving associated derangements. After the subsidence of the fever he used *Sulphate of Quinine* to ward off a secondary recurrence." For the hæmorrhagic cases he used *Sulphuric acid* and *Arsenicum*. The former remedy he called his sheet-anchor in the hæmorrhagic and flocculent black vomit. Ordinary emesis was controlled by *Ipecac*, *China*, and *Tartar emetic*. "Complicated with and following upon many cases of the continued nervous, typhoid and hæmorrhagic types of the disease, were hard swellings of the parotid and salivary glands, not infrequently developing into abscesses. These conditions were generally relieved by *Belladonna*, *Calcarea carb.*, *Hepar sulphur*, *Mercurius vivus* and *Nitric Acid*." *Camphor* was given when the primary chill was severe. Altogether Dr. Falligant's experience in the 1876 and previous epidemic was with over two thousand cases. His total mortality was 5.4 per cent., the regular mortality at that time being from 17 to 75 per cent.

Holcombe, of New Orleans, in the epidemic of 1867, made use of the serpent poisons. He said : "*Lachesis* is especially adapted to the nervous and *Crotalus* to the vascular elements of the disease—*Lachesis* to the nerve

poisoning, *Crotalus* to the blood-poisoning." He therefore gave Lachesis in the first stage and Crotalus in the second, indicated by the exhaustion, jaundice and hæmorrhage. He generally used *Argentum nitricum* for the vomiting; *Arsenicum* for the black vomit. *Cadmium sulph.* is theoretically indicated for this latter symptom. *Cantharis* was the remedy generally used by Falligant for suppression of urine.

Falligant has also offered the following additional indications:

Cystic hæmorrhage—*Cantharis*, *Belladonna* and *Arsenicum.*

Uterine hæmorrhage—*Secale* and *Arsenicum.*

Suppression of urine—*Cantharis* and *Sweet spirits of nitre.*

In the nervous and typhoid forms—*Bryonia*, *Arsenicum*, *Rhus tox*, *China*, *Nux vomica*, *Carbo. veg.*, and *Mercurius solubilis.*

In the colliquative cases—*Sulphuric Acid*, *Arsenic*, and brandy.

Convulsive symptoms—*Belladonna*, *Hyoscyamus*, *Stramonium* and *Opium.*

The alkaline treatment has become very popular of late years. It may be carried out by the administration of *ice-cold* carbonated Vichy water, or, if this is not obtainable, any ordinary alkaline mineral water to which Sodium bicarbonate has been added in the proportion of 30 grains to the pint. A variation of the alkaline treatment is Anderson's effervescing mixture, which is prepared by adding 30 grains of Potassium bicarbonate to a tablespoonful of freshly-expressed lime-juice. This mixture is given every two hours. When the stomach is too irritable to take fluids, the alkaline waters should be administered per rectum.

Olive oil is popularly regarded by many of the inhabitants of Cuba as an invaluable remedy. It may be given hot by inunction, or early in the course of the disease by mouth or rectum. The general opinion is that it acts as a nutrient, and not from the possession of any specific virtues.

## Dengue.

Although dengue is not a serious disease, so far as danger to life is concerned, the fact that it can occasionally through its complications seriously impair the general health, or lead to prolonged convalescence, makes it important that it should be treated seriously. Inasmuch as it occurs in epidemics from which comparatively few in a community escape, we presume it to be a contagious or infectious disease. Accordingly, it is important that the ordinary precautions in vogue for the prevention of diseases of these classes be enforced. There is some very strong evidence which points to a variety of mosquito known as the *Culex fatigans* as the cause of dengue. This suggests the propriety of keeping all patients under mosquito-netting, This precaution can certainly do no harm; hence it should be enforced.

The patient must be put to bed. His diet should be of a liquid character.

Owing to the profound exhaustion following the illness, the patient should be more liberally fed as soon as his condition will permit. Cooling drinks may be administered freely.

In the presence of the initial chill the patient should be well covered, and given a hot mustard-water foot-bath. If the fever is high, the best antipyretic is the hot bath. This measure, however, is ofttimes impracticable because of the severe pain the patients suffer on any movement, however slight. We must then depend upon hot sponging with cooling applications to the head.

As to remedies, the experience of Falligant* is our best guide. He says: "As internal remedies, *Aconite* and *Bryonia alba* are specially called for in the first stage with *Ipecacuanha* to relieve vomiting and *Arsenicum album* for diarrhœa. If the fever proves obstinate and the eruption is out on the skin, *Bryonia* and *Rhus tox.* are most useful.

"The disturbance of the stomach, such as flatulence, nausea, etc., call for *Colocynth* and *Nux vomica;* and the jaundice for *Mercurius sol.*, *China*, and *Nux vomica. Sulphuric acid*, *Arsenicum*, *Secale cornutum*, and *China*, sometimes followed by *Ferrum carb.*, are all needed in different hæmorrhagic conditions. Where there is a hæmorrhagic diathesis, it will be found advantageous to give internally a watery solution of *Tinct. ferr. chlor. fort.*, every two or three hours. Renal hæmorrhage requires *Cantharides*, *Belladonna*, or *Arsenicum.*

"Sponging with alcohol diluted with warm water often gives great comfort, especially in wiping away the disagreeable sweatings; and hot brandy toddies are of excellent service in conditions of prostration."

Hughes suggests that inasmuch as "the *Eupatorium perfoliatum* was found most beneficial in relieving the pains of break-bone fever, we may wisely hold it in readiness, as a possible succedaneum. In the second paroxysm, *Gelsemium* should take the place of Aconite; and the symptoms of skin and mucous membranes would seem to call for *Rhus tox.*" If pain is very severe and resists the ordinary measures as above outlined, the patient's comfort demands that we resort to one of the coal-tar derivatives, preferably Acetanilid or Phenacetin in combination with Caffein; or, if the circulation be weak, Morphia hypodermically.

## Cerebro-Spinal Fever.

(***Cerebro-spinal meningitis; spotted fever.***)

Just how far the ordinary measures to be adopted for the prevention of contagious diseases should be enforced, in the presence of cerebro-spinal fever, must remain doubtful until we have positive knowledge of the means by which the micro-organism producing it is carried and gains entrance into the system. Thus far, we know that in numerous instances the dis-

* Arndt's *System of Medicine*, vol. iii, p. 374.

ease has been transmitted from one member of a household to another; from neighbor to neighbor; and from patient to attendants. But we also know that in the vast majority of cases no such transmission has taken place. We know by experimental observations that infection may be introduced by way of the pulmonary alveoli and the nasal mucous membrane. It has likewise been demonstrated that the disease *may* be carried by fomites, and it has even been asserted that this is the chief means by which it is spread. Its micro-organisms are moreover capable of retaining their vitality for many months under favoring conditions. The contagiousness of the disease being beyond question, it would seem that its transmission requires certain favoring factors, *i. e.*, the predisposing causes. These include traumatism, cerebral exhaustion, general malnutrition, and some organic lesion.

With the above understanding of the methods by which cerebro-spinal fever is transmitted, we must enforce all the ordinary precautions which experience has taught us are useful in limiting the spread of the contagious diseases. Were our knowledge more exact, we might limit our efforts to the channels absolutely known to be the only ones by which the infection is conveyed. We must insist upon complete isolation of nurse and patient; all articles used in the sick-room must be disinfected or destroyed; after termination of the case, the premises must be thoroughly fumigated by formalin or sulphur dioxide. It is especially desirable that any fabrics soiled by discharges from the respiratory apparatus of the patient should receive particular attention, as it is to these the trend of medical opinion attributes the spreading of cerebro-spinal fever.

Inasmuch as the predisposing factors are essential, it is important that those in contact with the sick, and at epidemic times the community in general, should pay especial attention to the observance of strict hygienic practices.

While thus urging stringency in the quarantine of cases of cerebro-spinal fever, I do not wish to be considered an alarmist, for we all know that it is in exceptional instances only that we have instances proving, beyond all peradventure, a direct contagion. But in view of the extreme fatality of the disease, and our entire ignorance of the essential element or elements in its transmission, it is our duty to those entrusted to our care to enforce every possible precaution.

The diet of the patient must be liquid from the beginning. It is a much more important factor in treatment than is generally accorded it. All who have had any experience with the disease cannot fail to have noticed the rapid emaciation which takes place in those who are not carried off within the first 48 hours. Such failure of nutrition is readily accounted for by the profound toxæmia and its effects on the nervous system, especially by the active delirium and pain. The difficulties attendant upon

feeding still further favor emaciation. Liquid nourishment, then, should be given repeatedly at short intervals, and as opportunity offers. If the patient is unconscious, the food should be introduced by the stomach-tube three times in the 24 hours. Vomiting should not be a contra-indication to such feeding, for it is well known that, in this disease, it occurs independently of the taking of food.

Some patients can stand solid diet well. We may then order such articles as eggs, toasted bread, chopped meats, and the general run of the cereals.

The question of feeding at intervals must be left very largely with the nurse, who must seize every opportunity, however small, to introduce some nourishment.

Quiet must be enforced in the sick-room. Special attention must be paid to the urinary function, and the catheter used under antiseptic precautions when retention occurs. If the bowels are constipated, they must be moved by enemata or glycerin suppositories.

Frequent hot baths constitute the most important duty of the nurse in charge of a cerebro-spinal fever case. Properly and systematically administered, they greatly reduce the mortality of the disease. The temperature of the water should be from 100° to 105° F. The patient must be kept in the bath for twenty minutes. Under no circumstances should a longer interval than three hours elapse between the baths. Not only does the hot bath reduce the mortality of the disease, but it adds greatly to the comfort of the patient, as it lessens the intensity of pain and causes a relaxation of muscular rigidity, and exerts a favorable influence upon the temperature, pulse, and respiration.

The search for a specific remedy for this dread disease has led to some absurd therapeutic heresies. One of the most noteworthy of these was the use of diphtheria antitoxin. Its main advantage is that it does no harm. It now seems to be entirely forgotten, so far as authoritative medical literature is concerned. I mention it here lest a reader pins his faith on it and wastes valuable time.

Of late, lumbar puncture, after the method of Quincke, has come into strong favor as a therapeutic measure. The esteem in which it is held has been of gradual growth. At first, it was regarded as of doubtful utility. Increasing experience seems to demonstrate its actual value. Netter expressed himself as sceptical * concerning it, and later † became a strong advocate. Koplik, ‡ in detailing his experience, says: "Most of the patients were punctured three times in the course of the disease, and one more frequently. There was no routine in the procedure but each case was studied, and when symptoms of pressure or accumulation of exudate appeared the

* *Twentieth Century Practice of Medicine*, vol. xvi. † *Ibid.*, vol. xxi.

‡ *Medical News*, vol. lxxviii, p. 448, *et. seq.*

puncture was made. The indications were continuous headache accompanied by periods of somnolence and delirium, repeated chills with a sharp rise of temperature, an increase in the rigidity or opisthotonos, increasing or continued coma. If the immediate effects of puncture were favorable, the procedure was repeated if there was an exacerbation of the symptoms. If continued improvement followed puncture, the patient was no longer disturbed. In this conservative way no ill-effects of this method were observed." Strange to say, the puncture made no appreciable effect on either pulse or respiration.

The relief experienced was to the pain and the symptoms traceable to mechanical pressure of the exudate and toxæmia.

In his most recent article on the subject, Koplik* says: "Clinicians have not as yet come to any definite conclusions as to the utility of, and indications for, lumbar puncture. It certainly seems to be indicated in those cases of sudden onset with symptoms of complete collapse. In these, the collapse seems to be due to intraventricular pressure, and for this lumbar puncture is a relief measure of the highest utility, inasmuch as such pressure is very dangerous. When lumbar puncture is made 24 hours after the onset, after such a period of collapse as has been described, the fluid sometimes spurts several feet. In such cases the relief of the intraventricular pressure is really a life-saving procedure." And yet, while thus expressing his faith in lumbar puncture, Koplik elsewhere † makes the remark: "The one modern measure which has raised hopes, only to cause disappointment, is lumbar puncture."

Palliative medication, which includes the use of hypnotics and analgesics, is generally admitted by those who have had the most extensive experience with cerebro-spinal fever to be useless in most cases, and actually harmful in many. The drugs which have been employed include Morphia, Chloral, Potassium bromide, and Veronal.

Painful joints should be well wrapped in flannels and raw cotton. If swelling is present, the hypodermatic injection of a syringeful of a 2 per cent. pure (Merck's) *Carbolic acid* solution, should be administered once or twice daily, in the periarticular tissues. If signs of suppuration appear, the surgeon should be consulted promptly.

Quite a number of remedies have been used homœopathically in the treatment of cerebro-spinal fever with a fair amount of success, if we use old-school results by way of comparison, Hughes placing our mortality at 22 per cent. as against 72 per cent. mortality under old-school management at the same period. With improved methods of nursing and caring for the patient, we should obtain still better results in the future. We may divide our remedies for this affection into two classes, namely, those useful in the early stage, and those adapted to the fully developed fever. So rapidly does

* Osler's *Modern Medicine*, vol. ii, p. 518. † *Ibid.*, p. 517.

the disease reach its height that there is, as a rule, but a short time when we can utilize the remedies belonging to the class first named. They include *Aconite*, *Belladonna*, *Gelsemium*, *Veratrum viride*, *Cimicifuga* and *Bryonia*. Hughes looks upon *Aconite* as a perfect similimum to "the frankly inflammatory" cases, probably the most infrequently observed of the types of this disease.

*Belladonna* is probably indicated symptomatically with far greater frequency. Its symptoms include severe headache, delirium, flushed face, throbbing arteries, bounding pulse, retraction of the head, glistening eyes, dilated pupils, photophobia, twitching of the facial muscles, and hot head and cold feet.

*Gelsemium* is called for in those cases in which the disease is ushered in by a severe chill, followed by high fever. It has the severe occipital headache as an important indicating symptom. Muscular pains, which are entirely absent in the Belladonna case, are characteristic of Gelsemium. Any flushing of the face which may be present is not due to active congestion, as in Belladonna, but is a mere passive suffusion. Prostration is well marked from the beginning. In other words, the manifestations of toxæmia are present.

*Bryonia* finds its utility in cerebro-spinal fever mainly because of its ability to control inflammation of the serous membranes and its adaptation to typhoid states (toxæmia). It is called for at a later period than the preceding remedies, *i.e.*, when effusion has taken place. This will be indicated, clinically, by the onset of somnolence and coma, in addition to the occipital pain and retraction of the head.

The indications for *Veratrum viride* all relate to the circulatory system, and include the intense arterial excitement, full, strong pulse of high tension, etc.

*Cimicifuga* was suggested by Searle, of Brooklyn, as especially adapted to the pains and rigidities of the disease. It has, in my experience, been one of the most satisfactory of the remedies for the muscular hypertonicity and paralyses which continue for months after all acute manifestations of the primary disorder have subsided; when, indeed, the patient is considered well and is suffering from the resulting disability. It is certainly far more efficient than Gelsemium, which is commonly recommended. The special symptoms indicating Cimicifuga in the active stages of the disease are intense pain in the head, with rigidity of the muscles of the back and neck; sensitiveness of the surface of the body; muscular soreness; insomnia; alternation of tonic and clonic spasms; tensive or drawing pains; choreiform movements.

Some cases of cerebro-spinal fever are ushered in with foudroyant symptoms, the result of the profound toxæmia. The patient is cold and the surface of the body is cyanotic. The pulse is weak. Mentally, the

patient is stupid. Under such circumstances, *Ammonium carb.* will do more than any other remedy, although, at the best, the prospects of the case are by no means brilliant.

For the fully developed cerebro-spinal fever two remedies enjoy a good reputation, namely, *Cicuta virosa* and *Cuprum aceticum.* Cicuta virosa was first used by Baker, of Batavia, New York, who, in an epidemic at that place, is alleged to have treated 60 consecutive cases of cerebro-spinal fever without a death. Pathologically, it is homœopathic to the disease. Poisoning in the lower animals shows the presence of hyperæmia of the meninges of both brain and spinal cord. It also produces the characteristic petechiæ of the disease. Convulsions, with opisthotonos, followed by severe exhaustion, are prominent in the strict Cicuta case.

*Cuprum aceticum* is used by some physicians as a routine remedy. It is indicated by stupor, sinking of the eyes, coldness of the hands, twitching and jerking of the muscles of the face, sudden paroxysms of dyspnœa, and clonic spasms commencing in the fingers and toes.

For collapsic symptoms, *Camphor* and *Veratrum album* are suggested.

For the petechial type of the disease, *Arsenicum, Rhus tox., Baptisia, Crotalus,* and *Lachesis.*

*Hyoscyamus, Helleborus, Apis mellifica, Nux vomica, Opium, Zincum,* and *Æthusa cynapium* may occasionally be indicated.

In addition to Cimicifuga as a remedy for the nervous sequelæ, we may also think of *Potassium iodide,* especially for deafness and paralyses. It must be given in material doses, however, ten grains three times daily.

Convalescence is usually protracted. In addition to the nervous sequelæ of which mention has already been made, we have to deal with the malnutrition, which is to be met by good feeding, and the peripheral pains. The latter are best treated by remedies as indicated, and warm baths and massage of the extremities.

The damage done to the various cranial nerves is usually irreparable. No treatment other than the symptomatic can be recommended, and even that offers but little hope, no matter how early instituted.

I do feel the necessity of enjoining upon physicians and attendants the importance of prolonged and absolute rest. To order the convalescent patient to go about too soon as a remedial measure is worthy of very severe criticism.

Flexner,* who has been making extensive laboratory and clinical investigations concerning cerebro-spinal fever, has elaborated a serum with which he has made numerous experiments. In closing his last paper he says: "I have no desire to attempt to apply at this time, the results given herein of the experiments with the various sera on guinea pigs and monkeys to human beings the subjects of cerebro-spinal meningitis. The experi-

* *Journal of Experimental Medicine,* No. 2, 1907.

mental results with the anti-sera were not sufficiently constant and striking to make this mode of treatment of human cases of cerebro-spinal meningitis of very hopeful augury. On the other hand, it is not improbable that more active anti-sera, using appropriate means of immunization, may be produced. Possibly such anti-sera may prove of value in the treatment by direct spinal inoculation, possibly even by intravenous or subcutaneous injection, in this hopeless disease, etc." He goes on with a few remarks about hopeful possibility of future use in human cases.

## Cholera Asiatica.

**General Prophylaxis.**—In the presence of danger from cholera Asiatica, the health authorities find themselves under every obligation to prevent the further spread of the disease, for with our present knowledge that cholera is practically always a water-borne disease, the stamping out of an epidemic becomes a certain matter. The fact that the comma bacillus is introduced into the body by food and drink, but especially the latter, demands that we must pay especial attention to the purity of a water supply. The first duty then is the supervision of patients and suspected cases. Quarantine within certain limits is perfectly proper. All individuals having the disease should be promptly segregated, while those who may have been infected, but in whom cholera has not yet developed, should be isolated for five days. Even though strictly carried out, quarantine cannot do everything, for the disease may be carried by streams having their sources in cholera districts.

Ship sanitation must be enforced. Especial attention must be paid to the water in the tanks, and if found infected, to the thorough disinfection of the containers, that subsequent water supplies may be certainly safe. Food stuffs carried as cargo or ship rations are subjects for routine examination, as in many instances they are culture media for the comma bacillus. Water must ever be regarded as the most dangerous, for the comma bacillus may retain its vitality in this fluid under most varied circumstances; though it becomes especially active when the water is rich in organic matter and is at a temperature of 85° F. or somewhat above.

A case of cholera having been discovered in a community, the origin of the disease must be discovered. Almost invariably, this will lead to the discovery of other cases, and the exposure of unhygienic conditions demanding governmental attention. Under any and all circumstances, it must be kept in mind that the original source of infection—the means by which the disease is spread—is in the stools and vomited matters of cholera cases. Patients must discharge their excreta into a suitable vessel, and never into privies or water-closets direct. All dejecta must be subjected to the action of a 5 per cent. carbolic acid solution for at least one hour. Vessels must be boiled or subjected to prolonged immersion in a 1:1,000 solution of

mercuric chloride. Bedding and clothing must be disinfected by steam under pressure at a temperature of 230° F. for one hour.

Succeeding the recovery or death of the cholera patient the sick-room should be treated according to the principles laid down in the chapter on disinfection in general.

Authorities and individuals alike should in epidemic times pay every attention to the cleanliness and purity of food supplies. Especially does this remark apply to fruit and vegetables that are to be eaten uncooked. Has any one observed the fruit dealer preparing his wares for exhibit and sale? Is it not a matter of common occurrence to see these individuals polish an apple, a peach, or a pear on a coat-sleeve none too clean? And is it not a fact that men belonging to the fruit dealer class depend upon second-hand clothing stores or charity for raiment? And do not many charitable and penurious individuals give away or sell clothing for which they have no personal use?

Milk supplies must be guarded as jealously as the water, especially if diluted with the latter before boiling. It must be remembered that the mixture of milk and water is a good culture fluid for the cholera bacillus.

**Prophylaxis to be Applied by Individuals in Cholera Times.**—The dangerous character of cholera Asiatica demands great precautions in times of danger; and yet at the same time it is wise to observe the same with some regard to common sense. The precautions involve, first, the maintenance of a first-class standard of general health to lessen susceptibility to infection; and, secondly, the avoidance of food and drink that may have been infected. To secure the first of these, regular habits, attention to slight illnesses (especially those of the gastro-intestinal tract), and abstinence from alcohol are desirable. To secure the second, all water for table and culinary purposes should be boiled. As far as possible, all food must be cooked. Cold foods, as bread, meats, etc., may be eaten if their entire care since cooking has been within the jurisdiction of a reliable housekeeper. As to fruits, one can never have any guarantee of their freedom from the cholera bacilli. When on the stands it is handled by numerous prospective purchasers, to say nothing of being more or less soiled by dust. While thus inculcating care, I must warn against a morbid care that must create a more or less constant state of terror, which of itself must increase susceptibility by lowering the tone of the nervous system.

Needless to say, all individuals should avoid cholera-infected houses and strange water-closets.

Scrupulous attention should be paid to personal cleanliness.

The prospects of obtaining a cholera antitoxin which shall surely protect are not yet brilliant. Haffkine's serum appears to be capable of diminishing the susceptibility of the individuals and the mortality of the disease by one-half.

**Treatment.**—The cholera patient must be sent to bed as soon as the first symptoms of the disease are manifested, and efficiently isolated from the healthy. The usual attention to sick-room furnishings as required in the management of contagious diseases in general must be observed, notwithstanding the dejecta are the sole vehicle of contagion. The fewer the articles in the room, especially fabrics, the less materials there are to be infected by accidents, which cannot help but happen occasionally. All stools and vomited matters must be collected in a vessel and disinfected by one hour's exposure to an equal quantity of carbolic acid solution of 5 per cent. strength. Nurses in attendance upon the sick need have no fear of personal safety providing they observe proper precautions in cleansing their hands and soiled linen after attentions to the sick.

The **diet** of patients with cholera is not, as a rule, a very important matter, for the vomiting is so persistent that no food can be retained in the stomach. One's efforts must be largely limited to the quenching of thirst and supplying the system with water. Some regard even this as useless because of the prompt vomiting it excites. Still, some of the water must be absorbed, and that ejected serves in a measure to wash out the stomach. If food can be retained, the only articles permissible—and even these should be given scantily—are whey, gruels, bouillon, and peptonized milk. Acid drinks are permissible, as they are harmless, and add to the comfort of the patient. This list includes lemonade without sugar, lime juice, and diluted acid phosphates. It has been urged by some authorities that the induction of an artificial acidity of the gastric contents is a good thing therapeutically, for, say they, some of the acid ingesta must enter the duodenum, the contents of which temporarily acquire an acid reaction, which is detrimental to the growth of the comma bacillus, and thus the severity of the illness is mitigated. To secure this hyperacidity of the gastro-intestinal tract, dilute hydrochloric acid or aromatic sulphuric acid in doses of twenty to thirty drops in four ounces of water may be administered.

The measures used for quenching of thirst must vary with individual cases. There is no certainty as to which beverage will prove most agreeable to the patient. Selections may be made as to iced water, hot water, carbonated waters, iced champagne, etc. Drinks should be repeated at short intervals—say ten minutes—and in small quantities. It is ofttimes wise to have the patient hold the fluid in his mouth for a few minutes before swallowing. Occasionally, strong black coffee is very grateful.

Should the progress of the case be satisfactory, vomiting ceasing and collapse abating, attempts at nutrition may be made. Only the lightest liquid foods, and even these in small quantities, are permissible at first. The articles likely to be of use at this time are peptonized milk, koumyss, fresh beef-juice, nutritious broths, albumen water, and diluted whisky or brandy. With these articles accepted without discomfort or ill-effects, the

patient may be gradually restored to his normal diet, although it must be remembered that gastric irritability may continue for a couple of weeks after the subsidence of active symptoms.

For relief of the vomiting, the sucking of small pieces of ice, or small quantity of iced champagne is to be advised. Some authorities advise the administration of *Cocaine* or the hypodermic use of moderate doses of *Morphia* to allay gastric irritability. The case must be very aggravated to make these measures advisable. I would say that they are admissible only when the efforts at vomiting are productive of no result; for it is reasonable to believe that the stomach, being partially or wholly full of a serous fluid, the patient is certainly in better condition if the same is removed by emesis. Indeed, there are good authorities who make active use of this suggestion by resorting to repeated lavage, or the drinking of water in full expectation that it will be vomited.

The application of a mustard plaster to the epigastrium is at times a valuable means of relieving local pain and vomiting.

Warm bathing is undoubtedly a valuable remedy in many cases. The baths should be at a temperature of not less than 100°F., and may be gradually increased to 110° F. Their duration should be from fifteen to twenty minutes.

In cases of collapse, the direct infusion of a normal saline solution (0.6 per cent.) into a vein is productive of remarkable relief. The quantity injected may be anywhere from one pint to one quart, and it should be at a temperature of 105°F. Some assert that the high temperature of the injected fluid is its chief therapeutic claim. When the effect to be obtained from the infusion is not urgent, good results may be obtained from a hypodermoclysis of a normal salt solution.

For the cramps and pains in different portions of the body dry or moist hot applications may be made.

The principal remedies for cholera patients are *Arsenicum*, *Veratrum*, *Cuprum*, *Camphor*, *Cuprum arsenicosum*, *Secale*, *Ipecac*, *Bryonia*, *Rhus tox.*, *Ricinus communis*, *Jatropha curcas*, *Baptisia*, *Cantharis*, and *Terebinthina*.

*Camphor* was Hahnemann's great remedy from the earliest stage of the disease. He recommended it in one-drop doses repeated at very short intervals—in fact, as frequently as every five or ten minutes. Prostration is early, and is attended by general coldness of the surface of the body. The patient's voice is squeaky and high pitched. If vomiting and purging are present, they have not assumed sufficient proportions to account for the intense prostration.

*Cuprum* has been lauded by Hahnemann and others as having both preventive and curative properties in cholera Asiatica. Its prophylactic virtues rest upon the assertion that workers in copper do not contract cholera. It is indicated by intense coldness of the surface of the body,

blueness of the skin, cramps of the muscles of the calves and thighs (which may be drawn into knots), dyspnœa, and general distress.

*Veratrum album* is called for in cases presenting coldness of the surface of the body, but with the additional peculiarity that there is cold sweat of the forehead. The vomiting and purging are of high grade, and are attended by colicky pains and abdominal cramps. The stools are profuse and watery. Prostration is great, and emaciation is rapid.

*Arsenicum album* has as its cardinal indicating symptoms the great restlessness and anxiety. The stools are watery and profuse, but yellowish or brownish and offensive. The vomited matters are greenish yellow. Thirst is prominent. The surface of the body is cold, and yet the patient internally feels warm.

*Secale cornutum* is indicated in cases in which the patient is cold, almost pulseless in fact. Retching is spasmodic without much vomiting. The surface of the body is shrivelled and the skin dry; urine is suppressed; stools are profuse and watery. There are tingling and formication over the entire body. The patient, though cold, exhibits an intolerance of heat.

*Jatropha curcas* is suggested by the character of the vomited material, which has a ropy, albuminous appearance.

Urinary symptoms at times suggest the utility of *Cantharis* and *Terebinthina.*

For the collapse of the later stages of the disease, *Hydrocyanic acid.*

Opium and its preparations have been highly lauded for nearly a hundred years by numerous old-school authorities. Both symptomatically and pathologically they fail to reach the disease, and, as has been ably shown by Rumpf, are not only valueless but actually harmful.

Enemata of tannin solutions, recommended because tannin kills the comma bacillus, are likewise valueless, as statistics show that cases treated by this method are no better off than those treated on the expectant plan.

## Pneumonic Fever (Lobar Pneumonia); Broncho-Pneumonia.

Although pneumonic fever and broncho-pneumonia present well-defined differences as regards their clinical features, pathologies and general progress, the methods of treating them are so closely related that the therapeutics of these two diseases may be considered together with advantage. Whatever differences there may be in the management arise more from the special peculiarities of the patients themselves than from the symptomatic features of the diseases. In common with many other physicians, I have always taken a deep interest in all articles pertaining to the treatment of pneumonia; and I believe that, in common with them also, I have had little but disappointment for my pains. There is, therefore, no chapter of this work that has been approached with more fear, because no matter how

well the subject may be presented, the result must be as disappointing with me as it has been with others. Results cannot stand for much in the way of testimony as to the beneficial influence of any given line of treatment, for, as we have all had opportunities of learning, cases differ greatly in their severity, and only too often it is not so much the disease we have to fear as the patient who has taken it. If any testimony as to the unreliability of reports on the subject is needed, I may refer to the authors who have insistently proclaimed the specific influence of Potassium iodide, Creosote carbonate, Bisulphate or Muriate of Quinine, Digitalis, and hosts of other remedies as specifics; the wonderful statistics or claims of each author being completely refuted by those equally reliable. As a result of all this, the professional attitude concerning the therapeutics of pneumonia approaches well-nigh nihilism. Of course, we refer with pride to the results obtained by Fleishmann, who in a large series of cases had a mortality of but 5 per cent. The average mortality in 223,730 cases, collected by Wells, of Chicago, amounts to 18.1 per cent. Loomis * places the mortality of pneumonia in four of the large New York Hospitals at 35 per cent. to 40 per cent. While I am satisfied that we can show better results by far than 18.1 per cent., I can bring no recent statistics to prove my belief. Hospital experiences, while valuable in their way, are unreliable, because we have to deal with a class of patients *among whom the mortality should be large.* They include outcasts, the aged, the underfed, the overworked, and the inebriate, to say nothing of their frequent association with chronic renal disease.

So much by way of preliminaries.

The treatment of the pneumonias includes attention to hygienic details and the administration of curative and palliative remedies.

No one will dispute the statement that the earlier in the course of his disease the pneumonic patient comes under treatment the better will be the result. And yet, when one reads text-book after text-book he becomes painfully aware of the systematic neglect of this important point in statistical studies. We care not so much for the average mortality of pneumonia as we do for its special death-rate under special plans of treatment; and our investigations in this particular cannot be reliable unless we are assured that the therapeutist has been given a fair show. It seems to be too generally assumed that the pneumonia patient is sick enough from the inception of the disease to go to bed early, and yet this conception is far from the truth. I have had one patient enter the hospital at 4 P.M. to die at 11 P.M. the same day; and I have seen a number of dangerous cases admitted with physical signs to show the disease to be well advanced, and in which the existence of a chest affection had not even been suspected.

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* *Therapeutic Gazette*, February 15, 1906.

Truly, pneumonia, notwithstanding its clearly-defined symptomatology, is a treacherous disease. Reasoning from analogy, it is fair to believe that the earlier the patient with pneumonia is put to bed and at absolute rest the better should be the results, especially as many cases die, not from the pulmonary lesions, but from the associated toxæmia and cardiac changes.

Physical and mental rest is fully as important in pneumonia as in any other disease; and yet how frequently do we unconsciously ignore this proposition. True, we tell our patient to go to bed and stay there, but we are only too prone to disturb him by unnecessarily frequent physical examinations and ill-advised attempts at local treatment. One physical examination, thoroughly performed, will, in the majority of cases, be sufficient for all practical purposes. After that the physician can manage the practice of his percussion and auscultation in a way that will not disturb. But he should never neglect the heart and pulse. More can be learned as to the progress of the *patient* by studying his constitutional condition than by close inquiry into the pulmonary changes. The patient must avoid unnecessary exertion when attending to the bowels and the bladder. To this end, he must be taught to use the bed-pan.

Pneumococcic infection is favored by exposure to cold. It is necessary, therefore, that the patient be well protected from unnecessary chilling. To this end, the bed must be made warm. This precaution should be observed when changes of sheets are made. When the patient complains of cold extremities hot bottles should be used. On the other hand, we must not go to the extreme of keeping the patient too warm, as that is capable of doing harm. The clothing should be light but sufficient. The temperature of the sick-room should be maintained at from 65° to 70° F. Thorough ventilation must be secured. The latter desideratum must be accomplished, however, without exposing the patient to drafts.

In debilitated subjects, as in the aged, the alcoholic and the nephritic, and in infants with broncho-pneumonia, the position of the patient should be changed from time to time so as to avoid hypostatic congestion. Infants should be taken up by the nurse during coughing paroxysms and held face downwards.

It is wise to keep the atmosphere of the room moist by a kettle of boiling water in the room. In the case of infants, it is often wise to have a steam spray near the bed. Some physicians believe that this measure is made more efficacious by the addition of tincture of eucalyptus to the boiling water.

Bathing is necessary for purposes of cleanliness in the majority of cases. In very exceptional instances only should it be employed to reduce the temperature, as in typhoid fever. The pernicious effects of pyrexia are in direct proportion to the duration of the fever, and not to its intensity. Hence, in typhoid fever we find emaciation and prostration common; while

in pneumonia, which rarely continues longer than ten days, the patient is in good physical condition within a few days after passing through the crisis. So, unless hyperpyrexia is present, the fever of pneumonia may be left to itself. This injunction is made all the more important by the possibility of harm resulting from chilling of the bodily surface by undue enthusiasm in cold bathing.

The relatively short course of pneumonia relieves us of the responsibility of feeding the patient for strength, providing his physical condition has been good prior to the onset of the illness. As a rule, the patient will thrive on comparatively little food. This is fortunate, for the digestive apparatus, as a rule, is in such condition that but a small proportion of the nourishment administered can be digested and assimilated. In debilitated subjects and in patients at the extremes of life, it is essential to pay special attention to feeding, the nutriments required including milk, broths, eggs, custards, rice, tapioca and sago ; and the intervals between feedings should be about three hours. In pneumonias secondary to the acute infections it is especially important to be on guard for exhaustion. Water should be administered as freely as desired by the patient. Fruit juices are permissible. If the patient craves tea or coffee, these beverages may be prescribed, unless contra-indicated by undue mental excitement or sleeplessness.

The bowels should receive due consideration. If they incline to an undue degree of sluggishness, the use of enemata of water or glycerin will prove all sufficient. The necessity of attending to the constipation is made evident by the impairment of digestion and flatulence associated with that symptom. Flatulent distention of the abdomen is especially objectionable, as it interferes with free respiration.

In the majority of cases, the question of local applications is not an important one, so far as any real benefit to be derived from their employment is concerned. The patient and his friends expect local measures, and the mental satisfaction and ease to be derived from their use should be respected. In ordinary cases, the best local measure is the application of a light flannel jacket of one or two layers. Ice-bags and ice-jackets should be condemned, notwithstanding the endorsement given them by some authorities as a means of relieving pain. The hot-water bag and the hot poultice are much better and safer. When the pulmonary consolidation extends from day to day, or when there is pulmonary œdema, the use of antiphlogistin is to be recommended. Some object to this and other local applications as useless on the ground that pneumonia is a constitutional disease, and that its pulmonary changes are not influenced by local remedies. Nevertheless, I have felt that in my cases the application of the above-named remedy has proven of service. It has also proven of use in cases presenting delayed resolution.

The administration of alcoholic stimulants in pneumonia is a most im-

portant subject. The majority of cases do well without them. When, at the time of the crisis, there is some increased prostration or collapse is imminent, their employment is absolutely essential. In the case of patients who have been accustomed to use them regularly or in excess, it is impossible to secure good results without them. With cardiac weakness impending, alcohol is the best stimulant in the majority of cases. It is best prescribed in the form of whisky or brandy, the dose being regulated so that the patient takes from eight to twelve ounces in the course of the twenty-four hours.

In cases in which the chief danger lies in the pneumococcic toxæmia, large hypodermic injections of normal salt solution are effective and invaluable.

The remedies best adapted to the early stage of pneumonic fever are those advocated by Goodno, namely, *Ferrum phos.*, *Aconite*, *Bryonia*, and *Veratrum viride.* Of these, it seems to me that Ferrum phos. is the one which will be found most frequently of use. In those cases in which the fever is ushered in with a well-defined chill, and the history of exposure to cold is clear, *Aconite* is the remedy, especially when associated with the characteristic mental and nervous state of that remedy. At this stage, it is rare for the objective symptoms to be such as to show the patient is suffering from pneumonia.

*Ferrum phos.* is called for in cases in which the chill is poorly defined; the patient is usually one whose constitutional condition is more or less undermined by anæmia. The indicating symptoms include blood-streaked expectoration, dyspnœa, dry cough, and fever. If, as is usually the case, this remedy succeeds in modifying the symptoms, it is wise to continue it throughout the course of the illness, or until symptoms appear clearly calling for another remedy. Of the influence of Ferrum phos. on the course of croupous pneumonia there can be no question. Several times I have seen it bring the illness to its crisis in less than five days.

*Veratrum viride* finds a place in the armamentarium of both schools of medicine. The cases in which it is indicated are relatively few in number. This doubtless accounts for the diversity of views concerning it held by old-school physicians, some of whom accord it unqualified praise, while others condemn it without stint. It is indicated in the first stage of the disease, with tumultuously acting heart, rapid pulse, and dyspnœa as the prominent symptoms. The drug is a powerful cardiac depressant, hence should never be given in massive doses. At the most, the dose should be one to two drops of the tincture given every hour, or if the temperature be unusually high, every half-hour may be the interval. By some physicians it is regarded as efficient in those cases in which the right heart is laboring under the intense pulmonary stasis and as a substitute for bleeding.

*Bryonia* is indicated mainly by the local symptoms, being indicated in

those cases in which pain is a prominent feature. In order words, it is the remedy when the pneumonia is associated with pleural inflammation. Associated symptoms include dryness of the mouth, dry cough, dyspnœa, and thirst. The case is exceptional in which this medicine along with the application of dry heat and rest does not bring more or less complete relief to the thoracic pain. Like Ferrum phos., Bryonia may be continued with advantage throughout the course of the illness.

When the pneumonia is ushered in with vomiting, and this frequently happens, *Apomorphia* 2x is invaluable. It should be given in the form of tablets, every two hours. Solutions of the drug decompose within a few hours. The association of the disease with bronchitis makes its selection more timely. As in the case of Ferrum phos., I have been fortunate enough to abort several cases of pneumonic fever with it, the crisis in one case being reached upon the third day. As a rule, it is found to exert a sedative influence upon the nervous system, and modifies the chest pain.

*Phosphorus* is perhaps the most widely used of our pneumonia remedies. Its reputation is based very largely upon the experience and results of Fleishmann, in Vienna. Its local symptoms are not such as to suggest its use in pneumonia unless associated with bronchitic phenomena. Fleishmann, Farrington, and Ringer all unite in making the presence of typhoid symptoms the important indications for the drug. It is not as well adapted as Bryonia to the pneumonias associated with pleural inflammation.

The meningitis of pneumonia—pneumococcic meningitis—finds its most efficient remedy—if any remedy can be regarded as efficient in a complication of such mortality—in *Iodide of potassium.* The symptoms are such as we usually expect in cases calling for Belladonna, active delirium, flushed face, dilated pupils, etc. In delayed resolution, Iodide of potassium may be a useful medicine when other drugs have failed. In one recent case, in which extensive consolidation remained despite the entire absence of all subjective discomfort, recovery was finally brought about by Potassium iodide in substantial doses. Other remedies suitable for delayed resolution are *Sulphur* and *Iodide of Arsenic.*

Other iodides have been used by Goodno with satisfactory results. In fact, so far as I know, his work constitutes the entire literature on the subject. *Iodide of antimony* was proposed by him as the remedy for pneumonia associated with a marked bronchitis in phthisical subjects, and characterized by muco-purulent expectoration, or sputum of a rusty fibrinous character. *Stannum iod.*, likewise proposed by Goodno, is suggested as a remedy for the stage of purulent infiltration. The symptoms include large, moist râles in the bronchial tubes, difficult expectoration of "heavy yellowish brownish matter with some odor."

In the presence of a profound toxæmia—typhoid symptoms being present—we should have recourse to the reliable medicines ordinarily indi-

cated in typhoid fever. Including Rhus, Hyoscyamus, Baptisia, Antimonium tart., Ammonium carb. and Phosphorus.

With cardiac failure threatening, it is wise to resort at once to alcohol in one of its forms, but especially to whisky or brandy. If this does not secure the desired result at once, *Strychnia* should be prescribed. It is unquestionably the most satisfactory stimulant of the heart in pneumonic fever. It is best given hypodermically, in doses of one-sixtieth of a grain, every four hours, until danger has passed.

There is one variety of circulatory failure which may be referred to as special to pneumonia—I refer to a distended right heart brought about by the engorgement of the pulmonary circulation. The heart itself seems to be strong enough to do the work of ordinary health, but is incompetent to cope with the increased strain thrown upon it. Physical examination shows the extension of cardiac dulness to the right. The patient is cyanosed; breathing is short and labored. The pulse at the wrist is almost imperceptible, yet auscultation shows a heart acting with disproportionate force. The only remedy in such cases is a moderate bleeding, *i.e.*, of eight ounces. The result is usually astonishing. In the only case in which I was obliged to have recourse to it by the indications present, a patient who had been at death's door was within an hour brought into a marvelously good condition. Do not understand me as advocating bleeding as a remedy for pneumonia; but rather advising in cases in which a fairly good heart is laboring under an unusual turgescence of the venous system, that the circulation be relieved of some of its load. An exactly parallel case would be that of a horse with an overloaded cart at the foot of a hill, which he cannot climb by reason of the weight imposed upon him. Do not stimulate the horse by the whip; simply take off some of the load.

Of other cardiac stimulants the only one worthy of mention is Caffein, which may be used when Strychnia does not satisfy the requirements. I am aware that others have been recommended, as Digitalis and Nitroglycerin. Digitalis has been praised and condemned by equally prominent authorities respectively. As for *Glonoin*, it is not to be regarded as a heart stimulant in any sense of the term. Its use has been advocated as an arterial dilator, the theory being that by securing such dilation the venous system will be relieved. Such a use of the drug does not strike me as even approaching the rational. As for its use in ordinary cases of failing heart, again it seems to me that it is indicated in rare instances only. In pneumonia, as in most of the infectious fevers, the vascular tension is already low. To give Glonoin under such circumstance to secure its physiological effects does not seem reasonable.

## Influenza.

**Prophylaxis.**—Naturally, the eminently contagious character of influenza suggests that those suffering from the disease should be isolated to prevent the contamination of the healthy. In pandemic times, such as existed in 1891, the omnipresence of the influenza bacillus made such isolation valueless; hence, under such circumstances, it is hardly advisable to put patient and family to the inconvenience demanded to make it even approximately effective. But little can likewise be done in the way of conferring immunity. The most that we can expect in this direction is the general results to be obtained by the maintenance of personal health to the highest possible standard, thus increasing its resisting powers. Authorities have recommended the avoidance of large gatherings of people during epidemic times, and some have even gone to the extreme of advising remaining indoors to prevent infection. Such advice is valueless; neither is it of any utility. The advice to remain indoors seems ridiculous so long as the doors and windows of our abodes are not hermetically sealed.

As there is every probability that the influenza bacillus gains its entrance through the respiratory mucous membranes, it is a reasonable precaution on the part of the healthy to keep the mouth and throat in good condition by proper cleansing and the use of mild antiseptic gargles. We doubt the advisability of applying the same treatment to the nose, for the frequent douching of the nasal mucous membrane can readily excite a mild inflammation and thus favor the occurrence of the thing we desire to prevent. There can be no objection to the use of oily solutions in the form of vaporizers, though I doubt their utility.

The serious effects of influenza on the tuberculous demands that they shall receive special attention during the prevalence of an epidemic. Unfortunately, we cannot expect to obtain ideal results by way of prophylaxis. Our entire efforts must be limited to producing as high a standard of health as possible, and the avoidance of individuals suffering from the disease.

Something can be done prophylactically by those in charge of the sick-room. It is the common practice to adopt no precautions. The discharges from the respiratory mucous membranes should be collected and thoroughly disinfected before throwing away. Handkerchiefs and other linen used by the sick should be boiled and disinfected.

**General Management of Influenza Patients.**—In view of the great liability to secondary lesions of the respiratory tract and heart and other important complications, the influenza patient should be sent to bed no matter how mild his illness may be. He should not be permitted to sit up until at least twenty-four hours after his temperature has returned to the normal, and not even then unless all discomfort has left him and he is regaining his strength. It is wise for him to remain at comparative rest for a week after the onset of the attack. Such stringent measures in a disease

so generally reputed to be mild seem unnecessary, as indeed they are in most cases. But inasmuch as serious and even fatal consequences have followed speedily upon a neglected influenza, and as we never know which cases will take the unfavorable turns, it is the part of wisdom to follow the course I have outlined.

The physician should make systematic examinations of the heart and respiratory tract at each visit. Thus he will forestall any serious symptoms in this direction.

Patients should be made to understand the folly of self-medication and the use of nostrums. Much of the damage done by the coal-tar derivatives has arisen from this cause.

Warm baths often add to the comfort of the patient. Cold in any form is to be interdicted.

The remedies for the early and fully developed stages of typical or uncomplicated influenza are *Gelsemium*, *Aconite*, *Bryonia*, *Rhus tox.*, and *Eupatorium*.

Of these, *Gelsemium* and *Bryonia* are deservedly the most popular, as they are the most efficient.

*Gelsemium* is best given in the form of the tincture in doses ranging from one-half to one drop hourly. It is indicated by fever with chilliness, general languor, aching in back and limbs, headache, well-defined lethargy, and low vascular pressure. Probably three-fourths of the cases of influenza will be met by this remedy. Later in the disease, when there is evident involvement of the bronchial mucous membrane, and the pains are tormenting and widely distributed, *Bryonia* will be required. *Rhus tox.* is suited to cases in which the pains assume a rheumatic character with stiffness of joints and muscles, relieved by continued motion. *Eupatorium perfoliatum* is indicated by extremely severe and deep-seated pains, which have not inaptly been expressed as "break-bone fever."

Practically all cases will need no other medicinal treatment than the above. Occasionally, the pains become so persistent and tormenting that palliative medication is demanded. Under such circumstances, we may resort to analgesics, especially *Phenacetin*, *Acetanilid*, and *Morphia*. Of these I must express my decided preference for the former two. It is true that they belong to the much abused coal-tar derivatives, drugs which have undoubtedly done great harm in influenza. But when given in selected cases, *i.e.*, in cases occurring in patients free from cardiac disease, they are safe. They should never be administered with the idea of reducing the fever, but simply for the purpose of palliating the pains. If any fear exists as to their effect on the heart, they may be administered in conjunction with one-half grain of *Caffein*. Personally, I have always found that a single dose of seven grains of either drug with one grain of Caffein was all that was required. When there is undoubted cardiac weakness, and an analgesic

is necessary, *Morphia sulph.* hypodermically, one-eighth to one-quarter of a grain dose, not repeated, may be administered.

The complications of influenza for which special medicines are required include those relating to the lungs, heart, gastro-intestinal tract and the nervous system. For the bronchitis, the remedies are *Antimonium iod.*, *Kali bichromicum*, *Stannum iod.*, and *Bryonia.*

The secondary pneumonia requires no medicines other than those recommended for the treatment of pneumonia in general.

The gastro-intestinal disturbances require *Nux vomica*, *Ipecac*, *Arsenicum alb.*, *Cuprum arsenicosum*, *Hydrastis*, and *Cinchona.*

Post-influenzal neuritis yields to rest of the part, warm applications, and *Arsenicum*, *Belladonna*, or *Rhus tox.*

For the anæmia and prostration of convalescence, the principal therapeutic measures are rest, fresh air, and simple but nourishing food. The remedies are *Arsenicum iod.*, *Ferrum iod.*, *Ferrum redactum*, *Ferrum phos.*, and *Strychnia*, the latter in doses of one two-hundredth of a grain every two hours. Larger doses conduce to irritability.

For the nerve prostration, the best remedy is *Zinc phos.*, one tablet of the first decimal four times daily.

The mental complications and sequelæ of influenza are to be treated on the general principles involved in the management of mental diseases, which will be considered elsewhere.

## Scarlatina.

**Prophylaxis.**—The fact that there exists an immunity to scarlatina by many individuals should under no circumstances permit us to be in the least lax in instituting measures looking to the prevention of the spread of the disease. Quite naturally, our measures should be enforced with special care when those exposed to the contagium are those whom we have reason to believe are especially liable to take the disease. Reference is here made to other children in the household; for the later months of infancy and early childhood are most important factors in determining susceptibility. Infants of less than six months rarely contract the disease, and prior to the third month it is almost unknown. The age of greatest susceptibility is between two and five years. After the age of puberty has been passed the disease is very rare. Adults are practically immune.

In practising preventive measures, one must not depend too much upon the probabilities of immunity in individuals or families. That such immunity does exist has been abundantly proven by the reports of numerous persons who have been repeatedly exposed to the disease without succumbing to the infection. In many instances this immunity is but temporary, as has been demonstrated by many of the so-called immunes ultimately contracting scarlatina.

Until the ultimate cause of scarlet fever is discovered, we must remain at a loss as to what prophylactic measures should be enforced. We do not at this time know the special agency by which the contagium is transmitted. This being the case, we must rest content with making our prophylactic measures as strict as an intelligent ingenuity will permit.

We know that some epidemics have apparently been transmitted by the milk supply; some have been attributed to diseased domestic animals; others to school infection. There is a growing conviction that the nasopharyngeal discharges are the most important factor.

Isolation of the patient in a room on the uppermost floor of the house is always the first consideration. All articles not necessary for the care of the sick one should first be removed, leaving but the bed, a few chairs and a table. Whenever possible, the adjoining or communicating room should also be reserved. Through it ventilation of the sick-room may be secured. The door leading from the latter into the hallway should be locked, and the cracks between it and the jamb efficiently closed by plugging with rags. The avenue of ingress and egress should always be closed by a sheet wet with Labarraque's solution, 5 per cent. carbolic acid solution, or 1:1,000 solution of mercuric chloride. All other children of the household must be forbidden to attend school. If possible, they should be removed as far as possible from danger by sending them to the home of a relative or friends. The person in attendance on the patient should not be permitted to mingle with the balance of the family. Sentimental considerations must not permit parents and others to visit the sick one, even at long intervals or for but a few minutes. Usually these measures are successful in preventing the further spread of the disorder, for its contagiousness is believed to be slight during its earlier days, and the trend of evidence is against its conveyance by aerial infection.

The contagium of scarlatina is believed to be readily conveyed in the clothing. Hence, nurses and attendants should not communicate with the outside world without first having made a complete change of clothing. To prevent the hair from being a source of danger, a cap should be worn while in the sick-room. As far as possible, all clothing in use should be such as can be disinfected by boiling and washing.

The physician himself must pay attention to similar details. His stay in the sick-room is short, and the danger of his carrying the disease is correspondingly small. Nevertheless, it is wise for him to wear a gown which buttons up close to his neck, and a cap. After leaving the room and discarding his uniform, he should wash his hands and face carefully in an antiseptic solution.

Special attention must be given the discharges from the patient's mouth, nose and throat, as they are regarded as especially dangerous. To make assurance doubly sure, they should be received on pieces of muslin,

which should be thrown in an antiseptic solution, and afterwards burned. With older children, a sputum cup may be used; but it must be kept partially filled with a 5 per cent. solution of carbolic acid.

**Diet.**—During the febrile period of the disease, an exclusive milk diet is unquestionably the best, especially in younger subjects. Indeed, with them it may be continued to the end of the case with manifest advantage. With older patients, the milk diet becomes inadequate to the demands of nutrition, and other articles of diet are demanded when the fever disappears. We may then allow them bread and butter, custards, boiled rice, and a small quantity of stewed fruit. A more liberal dietary than this is objectionable on account of the liability of a nephritis.

No matter how mild the attack may be, the patient must be kept in bed until the fever has entirely disappeared. Whenever possible, confinement in bed should be continued for a couple of weeks later, especially in the case of young children, whose natural restlessness makes them uncontrollable while up and about. During cold and inclement weather especial attention must be directed to the avoidance of drafts. The patient should not be permitted to leave the sick-room until all danger of carrying the disease to others has disappeared; and this means not until desquamation has been completed, and all discharges from the nose and throat háve disappeared.

The liability to kidney disease and the great danger of this complication demands that the skin be properly cared for, and the patient sensibly clothed. Cleansing baths should be given daily. This is best done by sponging with tepid water. The clothing should be just heavy enough to make the patient comfortable, and no heavier.

The sick-room should be kept at a temperature of 68° to 70°F.

**Medical Treatment.**—Of the medicines useful in the treatment of scarlatina, *Belladonna* undoubtedly heads the list. In the early history of our school it was much vaunted as a prophylactic. Its administration for this purpose is not objectionable. At the same time, the evidence at our disposal is not such as to warrant much reliance upon its efficiency. Its sphere of usefulness is found in that class of cases known as the Sydenham type. The eruption is smooth and of a bright red color. If delirium is present it is active. Cerebral symptoms are commonly present, and consist of restless sleep, with crying out, twitching of muscles, and grinding of the teeth. The head is hotter than other portions of the body. The throat is bright red and swollen, the tongue coated, and the papillæ red and prominent. At times the tonsils are highly inflamed. It may also be indicated when the ears have become involved, and there is redness of the membrana tympani. It may also be used in the so-called asthenic cases, in which the rash does not appear, and the patient becomes pale or livid, rolls his head on the pillow, moans and screams, and the pulse is small and

rapid. Notwithstanding the intensity of the fever, the skin usually maintains its moisture. The majority of cases of scarlatina require no other remedy than Belladonna.

*Aconite* is advocated by some as a remedy for the initial stage. It is difficult to see how, in view of its symptomatology, it can prove of much value. With the advent of the fever, and prior to the onset of the rash, it may be indicated by reason of the dry, hot skin and the great restlessness. Aconite was recommended by Hahnemann as a remedy in the milary type of scarlatina. Late in the disease, when the child has caught cold by exposure during convalescence, it may well prove useful as a means of preventing the further progress of the ensuing complication or sequelæ.

*Gelsemium* is indicated in the early stage by intense fever and profound prostration. The pulse is frequent, soft and weak. The eyes present a heavy, suffused appearance. The tonsils are red and swollen, and pains shoot into the ear during the act of swallowing. Delirium, when present, is of a muttering character.

*Veratrum viride* is another remedy for the early stage of scarlatina. There is intense arterial excitement, as shown by the rapid pulse. Temperature is high. The patient may have convulsions, with greatly dilated pupils.

*Rhus toxicodendron* is commonly a remedy suited to the third or fourth day of the fever, though it may occasionally find a sphere of usefulness in the beginning in cases presenting prostration and restlessness. The high fever is associated with drowsiness. The character of the eruption is unimportant, the remedy being indicated by the general condition. Later in the case ulcerations are present in the throat, and are associated with enlarged glands, cellular inflammation, red glazed tongue; epistaxis; œdematous swelling of the skin. The eruption may become dusky with the development of miliary vesicles.

*Potassium Iodo-Hydrargyrate* (*Merc. iod. cum Kali iod.*) is a remedy highly praised by Goodno,* which he employs "from the beginning of the attack with most satisfactory results. Drop doses of a ten grain alcoholic solution every hour. Of all medicines, it has influenced the course of the disease most positively. Its effect upon sore throat and glandular symptoms is decided. It is possible that its value is largely due to its action as a germicide."

*Sulphocarbolate of soda* was the favorite routine remedy of the late Dr. James Kitchen.

While thus speaking of so-called specific remedies, attention may be directed to *Chloral hydrate.* This remedy, as is well known, produces a series of symptoms closely simulating those of scarlatina minus the high temperature. An old-school authority, Wilson, quoted by Hale, says:

* *Practice of Medicine* vol. ii, p. 258.

"The treatment of scarlet fever by the use of Chloral has given me better results than any other; it seems to be almost a specific for the disease. From the beginning, give Chloral in doses of two to five grains, and at intervals sufficient to keep the patient in a slightly somnolent condition. Give the Chloral in syrup of lactucarium, and it will be taken very readily by the child."

*Quinine* is used very largely by old-school practitioners. As is well known, this drug likewise produces a most excellent clinical picture of scarlatina. One of my patients, who suffered six times from the Quinine exanthema, had his case diagnosed by eminent dermatologists on two occasions as scarlatina.

*Apis mellifica* is indicated in cases presenting the miliary type of eruption; the throat is puffy and there is œdema of the uvula; suppression of urine; urine dark red and scanty, containing epithelium and casts; post-scarlatinal nephritis; anasarca with thirstlessness; pale, waxen skin; erysipelatous rosy appearance on dropsical extremities; orthopnœa; bronchial catarrh.

*Arsenicum Album.*—Slow development of rash; or when rash appears it is interspersed with petechiæ; convulsions, followed by stupor; vomiting and diarrhœa brought on by food and drink; otitis media, discharge being profuse, watery and ichorous; urine albuminous, dark red and bloody; dyspnœa; restlessness; puffiness of the eyelids; general dropsy.

*Camphor* is indicated in cases presenting a low temperature and collapsic symptoms; prostration is marked; the face is hot and purple colored or pale, while the extremities are cold; involuntary blackish stools; accumulation of mucus in the air-passages; skin shrivelled. Camphor is best administered in the tincture, one or two drops at intervals of half an hour.

*Hydrocyanic acid* is to be administered in cases presenting adynamic symptoms from the start. The rash is livid, and interspersed with petechiæ. The pulse is rapid and feeble; defecation and micturition are involuntary; paralysis of deglutition, as shown by the gurgling sounds in the throat during attempts at swallowing. Such cases are almost hopeless from the onset, but occasionally Hydrocyanic acid, 3x, pulls one of them through.

*Cuprum aceticum* is useful in cases in which convulsions are a prominent feature. There are violent delirium and loquacity. The child is frightened on awaking from sleep or on regaining consciousness. When the convulsions occur as part of the phenomena of a nephritis, *Cuprum arsenicosum* is the most efficient remedy.

Cases of the so-called scarlatina maligna call for *Arum triphyllum*, *Ailanthus*, *Lachesis*, and *Crotalus*.

*Arum triphyllum* has, as its characteristic indicating symptom, discharges from the nose and mouth of exceedingly excoriating character. The tongue is greatly swollen, with large and red papillæ. The throat is

exceedingly painful, and the seat of putrid ulcerations. Scabs form about the mouth. The rash is dark and develops in patches; marked inflammatory swelling of the submaxillary glands; suppression of urine with uræmic symptoms.

*Ailanthus* presents symptoms very similar to those calling for Arum triphyllum, but differs from that remedy mainly in the cerebral manifestations, which consist of stupor rather than restlessness. The rash is dark red and purplish and mixed with petechiæ. There is also well-marked infiltration of the cellular tissue of the neck.

*Lachesis* is suited to the cases presenting the highest type of adynamia. The patient is drowsy; the rash develops imperfectly or slowly, and is of a dark purple hue. The throat presents the pseudo-membranous formations; and the cellular tissues of the neck are highly inflamed, with every appearance of going on to suppuration. The throat presents a dirty white deposit on the tonsils; the tongue is dirty yellow at the base, with red papillæ showing through. The pulse is weak and the surface of the body cool. Hæmorrhagic manifestations, especially from the mouth and nose.

*Crotalus* is indicated even more clearly than Lachesis in scarlatina maligna in which the hæmorrhagic symptoms are manifested. Bleeding occurs from the mouth and nose; hæmatemesis; urine dark, scanty and containing decomposed blood; inflammation, progressing to gangrene of the cellular tissues of the neck; low muttering delirium.

*Ammonium carb.* may be utilized as a stimulant in cases presenting the phenomena of uræmia with miliary rash, enlargement of the cervical glands and cellulitis. Drowsiness is the characteristic mental condition.

For the post-scarlatinal nephritis, the principal remedies are *Terebinthina*, *Hellebore*, *Digitalis*, and *Apis*.

Of these, *Terebinthina* is the one most widely used. The urine is smoky and turbid in appearance. The patient has dyspnœa, requiring to be propped up in bed; the tongue is dry and glossy. Terebinthina is one of the best remedies for hæmorrhages during the course of scarlatina.

*Digitalis* should be preferred when the heart manifests signs of weakness.

*Hellebore* presents the ordinary phenomena of acute nephritis, but there is a prominent feature, pronounced sensorial apathy. Or the patient constantly rolls his head, moaning, grinding the teeth, pupils dilated; face pale and puffed; difficult breathing; diarrhœa, stools presenting the appearance of jelly-like mucus.

**Hydrotherapy.**—Hydriatric measures enjoy a great reputation in the treatment of scarlatina. The rationale of their action lies in their ability to stimulate the circulation and aid in the throwing off of the toxins of the disease. The fear that they increase the liability to nephritis seems to be without foundation. Schill, of Wiesbaden, treated 110 cases by hydro-

therapy; of these but one developed a nephritis. Baruch is not inclined to commit himself as to the influence of hydrotherapy in preventing nephritis; but he declares that the patient is certainly placed in a condition better able to stand the effects of this serious complication; nor would he omit such measures if symptoms suggestive of an oncoming nephritis had appeared. On the contrary, he would direct his hydriatric treatment with the special view of mitigating the renal inflammation.

The most successful plan of hydrotherapy in scarlatina is the cold bath. The temperature of the water should be regulated by the extent of the pyrexia. If the latter reaches 104° F. the water should be at a temperature of 68° F. The baths should be of short duration, usually not more than five minutes; and they need not be repeated oftener than twice daily. Following the bath, the patient is lightly and quickly dried and returned to his bed. If the fever is but moderate the bath need be only lukewarm. In many such cases simple, cool sponging will be all-sufficient.

Cohen and Comegys * recommend a different course, advising warm or hot baths (85° to 100° F.), excepting in cases exhibiting high fever. They regard, and herein they are in accord with others, the hot applications as especially valuable in cases presenting delayed or incomplete eruption. With high temperature, Cohen recommends the graduated bath as used in typhoid fever; and in some instances a tepid bath (85° to 90°) followed by a cold ablution (50° to 60° F.) of brief duration.

In cases in which the heart and brain are overwhelmed by the toxins, and the case seems desperate or even hopeless, von Jurgensen† recommends that we proceed as follows:

"1. Upon signs of marked stupor and subnormal temperature, a douche of quite cold water, of short duration, chiefly over the back of the neck and head, and given with the patient in the warm bath. If a positive result is obtained, even if only a temporary one, this may be repeated after one or two hours.

"2. If convulsions are also present, a long-continued (ten to fifteen minutes) warm bath, and then at the end of the same a douche as before. No narcotics are to be used.

"3. In case of high fever it is important to discover whether the skin be hot or cold.

"(*a*) If the latter, the condition suggests a considerable weakness. An injection of ether, often followed by camphorated oil, if the condition has improved and the pulse has become stronger, or is only, as is often the case, barely to be felt." "The ether injection may, in certain cases, be repeated every half-hour, and that of camphorated oil only after a long time—ten hours. If the skin is cool, or even cold, it cannot, to any con-

* *System of Physiologic Therapeutics*, vol. ix, p. 525.

† Nothnagel's *Encyclopædia: Diphtheria, Scarlet Fever, and Measles*, p. 619.

siderable extent, give off heat in the cool bath, yet thermic stimulation will awaken a response. The application of cold is justified only when a sufficient quantity again begins to circulate at the periphery. We may attempt, in addition to the cardiac stimulation, to see how far we may obtain a result with a warm bath (about 104° F.) in which the patient remains up to ten minutes with his skin being well rubbed." "Should the condition so far improve that the worst symptoms would seem to be averted, even in the slightest degree, then the skin, which has become warm, may be douched over the entire body with cold water, though only for a minute. If the skin has not first become warm this is absolutely contra-indicated.

"(*b*) A high internal and external temperature of the body—genuine hyperpyrexia, without marked influence upon the circulation and accompanied by a hot skin—calls for the earliest and most active measures.

"Close attention must be paid to the heart. If there is a high pulse-rate, I make it a custom always in advance to use strong cardiac stimulants, whether in the shape of strong wine or of an injection of camphorated oil.

"If the temperature of the body has suddenly risen to 105.8° F., no one can tell whether, in addition, true symptoms of intoxication are present or not. An attempt to better the condition by reducing the temperature is not only allowable, but necessary, if—and this is indispensable—the heart can do the work it is called upon to do."

"No result will be attained in cases in which three cold baths, two hours apart, are unable to overcome the rise of temperature."

Von Jurgensen states the contra-indications to the cold-bath treatment as follows:

"1. All markedly developed conditions of cardiac weakness, from whatever cause, in case the attempt to considerably increase the cardiac action by stimulants fails.

"2. All signs of dyspnœa accompanied by stenosis of the upper air-passages. Violent respirations can, in such cases, only bring harm to the patient.

"3. Hæmorrhage from the nose, the mouth, from eroded vessels in the neck, in hæmorrhagic diathesis.

"4. All joint inflammations. If no appreciable advantage is to be expected we should spare the patient the pain that is unavoidably caused by the exertion involved in the bath."

**Treatment of Special Organs and Symptoms.**—The Nose.—The appearance of a rhinitis with purulent discharge calls for prompt cleansing measures. The most satisfactory method of application is to place the child on one side, while lying in bed, the nurse injecting the solution selected by means of a half-ounce piston syringe through the upper nostril. The solution readily escapes through the lower nasal passage.

The solutions used should be of the mildest possible. In many instances normal salt solution is all-sufficient. One may also prescribe Dobell's solution, which is prepared as follows:

| | |
|---|---|
| Sodii boratis. | |
| Sodii bicarbonatis, | āā ʒj. |
| Acidi carbolici, | gr. xxx. |
| Glycerini, | f. ʒj. |
| Aquæ puræ, | Oij. |

Internally, may be administered, *Kali bichromicum*, *Ailanthus*, *Arum triphyllum*, *Merc. iod. cum kali iod.*

**Otitis Media.**—The prevention of this complication depends mainly upon attention to the nose and throat. In many cases it develops without symptoms, the first evidence of its presence being the appearance of the aural discharge. It should, therefore, be a routine practice on the part of the physician to examine the ears with mirror and speculum at each visit—a task that at times may prove to be most difficult, owing to the refractoriness of the patient, and the small size of the auditory meatus. In the majority of cases, the membrana tympani ruptures promptly. Should the disease be discovered before that happy event takes place, the drum-head should be incised. With the free discharge of the secretions, the parts must be kept clean by instillations or gentle syringings of hot mild antiseptic solutions, as Mercuric chloride, 1:10,000 or saturated solution of Boric acid. If the discharge should cease suddenly, and, at the same time, the temperature should rise, an infection of adjacent structures, usually the mastoid, is suggested. Such cases demand the co-operation of a special aural surgeon.

During the initial stage of the otitis, the patient may complain of severe earache. This may be relieved by the application of the hot-water bag, or dry hot flannels or the hot salt bag to the external ear. Another suggestion is the insertion of a raisin, that has been soaked in hot antiseptic solution, in the external meatus.

The remedies for the otitis media of scarlatina are *Belladonna*, *Mercurius*, *Silicea*, *Pulsatilla*, and *Rhus tox.* With the extension of the septic inflammation to the intracranial structures, surgical intervention is of questionable value, unless the diagnostic and therapeutic indications are clearly defined. The diagnosis is made doubly difficult by the association of many severe cases of scarlatina with cerebral manifestations, as delirium and stupor.

**Throat.**—The importance of attention to the throat in scarlatina resides in the fact that it is through this organ that the more serious lesions of otitis media and lymphatic and cellular tissue inflammations of the neck take place. Such secondary infections may take place even in the mildest cases. It therefore behooves us to watch the throat under any and all cir-

cumstances. In the simple cases, when taken early, ordinary cleansing measures are ample. These include spraying with such mild preparations as Dobell's solution or saturated solution of Boric acid. Gargling is of but little use, as the medicaments do not reach the parts diseased. Besides, very young children and many older ones cannot perform this act. In more severe cases, the spraying fluid should consist of equal parts of hydrogen peroxide and water. Occasionally, one meets with a child who struggles so against local measures as to make such interference unwise, if not dangerous. As a rule, a little tact and firmness on the part of the nurse will accomplish the desired end.

The remedies especially indicated for the throat symptoms of scarlatina are *Belladonna*, *Phytolacca*, *Lachesis*, *Kali permanganicum*, and *Mercurius biniod.*

The stimulating cold-pack, renewed every two hours, is very useful in alleviating the throat symptoms of scarlatina and lessening the chances of local infection. The repeated swallowing of small pellets of ice is grateful and lessens the pain.

**Lymph Glands.**—In the early stages of the lymphatic enlargements, the most satisfactory measure is the ice-pack or ice-bag. When, despite this, the swelling continues to increase, and it is evident that the inflammation will progress to suppuration, the change should be made at once to hot poultices, and with the first evidence of suppuration a free incision should be made. In the case of a diffuse cellular inflammation, it is a wise plan to make a very free incision without waiting for the formation of pus. In all cases there should be free drainage ; in other words, the fundamental principles of surgery should be followed.

**Arthritis.**—The treatment of the arthritis of scarlatina will depend very much upon the view one holds as to its pathology. If he holds to the old idea that it is a rheumatism, quite naturally his remedies will belong to the class of antirheumatics, as *Rhus*, *Bryonia*, *Colchicine*, and the *Salicylates*. If, on the other hand, he regards the lesions as septic, as they probably are, he must treat the case accordingly. The local treatment in the beginning should consist of flannel protectives or hot applications. Benedikt's method of hypodermic administration of carbolic acid, 2 per cent. solution, about the affected articulation appeals to me very strongly as a valuable treatment to try. When, in the course of the arthritis, there appear chills, fever and sweats, intra-articular suppuration is suggested, and the surgeon should be consulted as to the advisability of opening the joint cavities, washing them out, and establishing thorough drainage.

**The Heart.**—The cardiac disturbances of scarlatina include, first, those which may occur in the course of any severe acute infection, namely, a flagging heart. With the advent of this phenomenon, the indication is for stimulation, usually by alcohol, though Strychnia and Caffein will also be

found to be valuable. The Strychnia should be given in doses of one two-hundredth of a grain every four hours; the Caffein in doses of one grain at the same intervals.

A complicating endo- or pericarditis must be treated on exactly the same principles as those governing such lesions occurring otherwise. Special attention must be paid to rest and quiet. The application of the ice-bag to the præcordium has been recommended, but I fail to see how it can be of much benefit.

**Hæmorrhages; Purpura.**—The danger in hæmorrhagic scarlatina lies in the resulting anæmia, the effects of which are intensified by the general infection by the scarlatinal poison. The treatment in these cases must be entirely medicinal, excepting when the seat of hæmorrhage is accessible surgically. Otherwise, we must rely upon *Terebinthina*, *Lachesis* and *Crotalus*. After the hæmorrhage has ceased, *Cinchona* is the best restorative.

**The Skin.**—The instructions already given relating to bathing and hydrotherapy provide for the management of the skin in most cases of scarlatina. Occasionally, it happens that we have to deal with a case in which itching is intense. As a palliative, we may resort to anointing the skin with menthol, one per cent., in lanolin or cocoa butter.

Later, with the appearance of desquamation, it is a good plan to keep up the inunctions with either of the above fatty bases with the idea of preventing the dissemination of the desquamated epithelium about the room.

**Gastro-Enteric Symptoms.**—Those demanding relief are the vomiting and diarrhœa. The former may be relieved in great measure by the administration of pellets of ice. Active measures are rarely required, for it usually ceases spontaneously within a short time. The diarrhœa may be sufficiently severe to require attention. In this case we should treat the case symptomatically. The severe diarrhœa sometimes coming on late in the course of scarlatina and dependent upon inflammation of the colon, sometimes requires colon irrigation with normal salt solution as an adjuvant to symptomatic medicinal treatment.

**Toxæmia.**—In addition to the medicines already mentioned as valuable in scarlatina maligna, we may adopt Forchheimer's* suggestion of venous infusion of normal salt solution or hypodermoclysis. Certainly, this measure is of value in many of the cases of impending nephritis, and we have good reason to believe that it should prove efficient in the scarlatinal as in other types of toxæmia.

**Nephritis.**—The efficient management of scarlatinal nephritis demands early recognition. To this end, it should be the routine practice of the physician to examine the urine daily for albumin and casts, and insist upon the nurse keeping accurate measurements of the daily urinary excretion.

* *Twentieth Century Practice of Medicine*, vol. xiv, p. 100.

In exceptional cases only will this practice fail to warn us of danger. In the latter class, symptoms of an alarming character may develop almost without warning. I doubt very much if such clinical phenomena as pallor and œdema are as important as strict attention to the state of the urine. A certain amount of albumin must be expected in a very large proportion of scarlatina patients. With the appearance of signs indicating a nephritis, the patient must be kept at absolute rest in bed, and a strict milk diet maintained. Diuretic drugs, as recommended by old-school authorities, do not seem to meet with general approval, even by the members of that school. Ordinarily, it is best to confine our medication to such remedies as *Aconite*, *Terebinthina*, *Cantharis*, and *Arsenicum*.

All authorities unite in speaking well of hydrotherapy in the presence of this serious complication. Ordinarily, hot baths at a temperature of 95° F. are best. In the case of older children, the water may be made still hotter by the addition of small quantities of boiling water while the child is in the bath, care being taken not to burn or scald the patient. It is usually good practice to make cold applications to the head or administer cooling drinks while the patient is in the bath, which may be continued for as much as half an hour. The patient is then removed and dried quickly and placed between dry blankets. The effect of the treatment is to produce profuse diaphoresis and lowering of blood-pressure.

Kussmaul* objects to the hot bath, and recommends the cold-pack, followed by enveloping the patient in dry blankets.

Should hydrotherapy fail to bring the desired relief, recourse may be had to the hot-air bath.

Throughout the course of a scarlatinal nephritis, careful observations must be maintained as to the condition of the chest, lest a hydrothorax or hydropericardium develop. The failure to recognize these and institute the proper mechanical treatment may lead to an unexpected fatal termination.

Should convulsions develop, the hot bath may be repeated. Palliative drugs may here prove necessary. The disturbance in the circulation brought about by the convulsive state may lead to visceral hæmorrhages, especially cerebral. To check them, we may administer Chloral hydrate and Potassium bromide by the rectum. This advice is given assuming that *Cuprum arsenicosum*, which is the best remedy for acute uræmia, fails.

Should the case terminate favorably, convalescence must be watched with the greatest care. The albuminuria and casts need not be expected to disappear for some time; indeed, it may be a year or more before the urine is perfectly normal, Such delayed recovery should be accepted as a matter of fact, and not give rise to fears of permanent kidney lesion, or lead the physician to be hysterical in demanding rigid diet, etc. The

* *Berliner klinische Wochenschrift*, July 9, 1898.

patient should simply be watched with discriminating care, and kept from violent exertions. His diet should be a mixed one after he is able to be about, but it should not be permitted to be too rich in nitrogenous foods.

**Convalescence.**—In any event, the scarlatina patient should be kept in bed for three weeks. He should not be permitted to leave the sick-room until desquamation has been completed. Weather conditions or other causes may, in the judgment of the physician, greatly prolong the period of confinement. Frequent examinations of the urine should be made after the patient has resumed his ordinary life. Especially should the influence of exercise on the urinary excretion be noted. The question of diet during convalescence relates solely to the possibility of a nephritis.

**Disinfection.**—Until the pathogenetic cause of scarlatina is known, our precautions against the dissemination of the disease by those who have recovered from it must be very strict. The desquamated epithelium was for a long time regarded as dangerous. This view has been greatly modified, until now there are some who look upon this factor as of little importance, believing that the secretions of the nose, mouth and throat contain the element of danger. We should, therefore, positively refuse to permit the patient to mingle with the outside world until all such discharges have ceased. No child should be permitted to return to school until two months have elapsed since recovery. This is harsh advice, it is true; but if every one followed it the number of cases would be greatly diminished, even though the disease be not stamped out altogether.

Disinfection of the sick-room and its contents must be carried out with great thoroughness, owing to the tenacity of the scarlatinal contagium. All articles of little intrinsic value, as toys, books, papers, etc., should be burned; and the same applies to others which are incapable of disinfection by ordinary measures. This refers especially to the mattresses. The paper should be scraped from the walls, which should then be wiped down with a solution of bichloride, 1:1,000. The floors and woodwork generally should be scrubbed with the same strength of mercuric chloride solution. The room should then be thoroughly fumigated with formaldehyd vapor, the quantity used and the time employed being greater than ordinarily recommended for disinfection after contagious diseases generally. Following these precautions, the windows of the room should be kept open and the apartment well-aired for a week or two, whenever it is possible to do so. Then the room may be repapered.

Sheetings, blankets, and furniture should be disinfected by bichloride, 1:1,000; carbolic acid, 1:40; or by superheated steam under pressure.

## Measles.

**Prophylaxis.**—Of all the acute infections, measles appears to be the most eminently contagious, very few persons being immune. So patent is this fact to the laity and the profession that scarcely any efforts are ever made to prevent its spread. People seem to have accepted the situation philosophically, and assumed that inasmuch as children will almost certainly have the disease some time, they might as well "take" it now as any other. The sooner this fatalistic view is dispelled the better it will be for humanity. While the mortality of measles in the well-to-do classes is small, the average taken from a large number of cases is such as to make us accept the dictum that it is a serious disease, if not in itself, then because of its sequelæ and complications. Admitting that all children must sooner or later sicken with it, we nevertheless should endeavor to defer that time until the age at which the mortality is at a minimum has been attained. Infants fortunately exhibit a relative immunity, so that our anxiety concerning them is relatively small. Of the total mortality, four-fifths occur in children less than five years of age. How, then, shall we proceed to prevent the onset of measles until this age has been passed?

Unfortunately, the experience of all practitioners shows that, despite the most careful isolation, a case of measles having occurred in a household will almost certainly communicate the disease to all other residents therein. This communicability is due, I believe, to the early stage of the disorder at which it is possible to communicate the contagium. Numerous examples have been reported to prove conclusively that it may be communicated even before the initial symptoms have been manifested, *i. e.*, when the person about to be taken with it, is apparently in the best of health. Isolation then, to be of value, should be practiced at the moment suspicion is first aroused. Time to make suspicion a certainty should not be permitted to elapse.

The ordinary rules governing the selection of the sick-room, its furnishings, and the conduct of the nurse or attendant, and the methods of disinfection practised in the case of other infections should be followed. There is, fortunately, one condition to make us successful in our efforts: the contagium of measles is very short-lived. Hence, ventilation and time do much to relieve the danger of infection from the sick-room and fomites. The patient himself is rarely, if ever, dangerous to others two weeks after the termination of desquamation. Some even deny that the patient is dangerous to others during desquamation; and Comby says: "We know to-day that measles ceases to be contagious after the eruption." The most that we can expect from rigid isolation is a slight reduction in the number of cases.

**General Management.—The Sick-Room.**—Ventilation is the first desideratum in the arrangement of the sick-room. This may readily be

secured, and the temperature of the room maintained at 70° F., without exposing the patient to any drafts. As measles is practically always associated with a bronchitis of mild or severe degree, precautions advisable in the treatment of the latter affection must be adopted. A dry atmosphere being irritating, it is very important that a kettle or pan of water be kept boiling in the room. This may be medicated with Eucalyptus or Compound tincture of Benzoin, if the physician so desires.

For many years it was the custom to bundle the patient up to an extent to intensify the discomfort of the measles. Unfortunately, this practice is not obsolete in some quarters. The common-sense practice prevailing in the management of other infections should be instituted here, and the patient protected so as to be comfortable and free from chills. On the other hand, carelessness, such as changing the bed-linen in cold weather without a preliminary warning, is bad practice.

Another bad practice that is fortunately dying out is the darkening of the sick-room. The proper course is to subdue the light just sufficiently to take the glare out of the room.

**The Mouth.**—It is well known that the mouths of most healthy individuals are rich in pneumococci and other micro-organisms. Fortunately, the virility of these is not great. Nevertheless, in view of the frequency with which pneumonia occurs as a complication of measles and its great mortality, it is a wise precaution to look after the mouth from the beginning of the illness. Mild antiseptic mouth washes are invaluable. Among those to be recommended are boric acid solutions, listerine, glyco-thymoline, and hydrogen peroxide.

The advisability of local measures to the nose and throat does not impress me. What is to be gained in the few by routine applications is counterbalanced by the needless disturbance of the many.

**Care of the Patient.**—The patient must be kept in bed throughout the continuance of the febrile stage, and until the entire disappearance of the rash. This much is certain. Further confinement must be according to the judgment of the physician based upon the severity of the catarrhal phenomena, the season, and the state of the weather. In the majority of cases, the patient may be permitted to go out of doors in two weeks after the subsidence of the fever.

The diet should, as far as may be possible, consist of milk, plain or diluted with lime water or barley water. Should the child refuse nourishment there need be no anxiety, as measles is a disease of short duration. The exhaustion arising from the starvation is not likely to prove of much importance. Children may often be tempted with ice cream, which is not objectionable unless taken rapidly and in too large quantities. Water for drinking purposes is permissible in all reasonable amounts.

Cleansing baths should be administered each day. If itching is a prom-

ment symptom, it may be alleviated by sponging with one per cent. carbolic acid solution. Should the family be one in which the prevalent prejudice against bathing of measles patients is well rooted, it will be the part of diplomacy on the part of the physician not to insist upon this item of the treatment.

The strict following of the above directions will greatly lessen the frequency, if not entirely prevent, the occurrence of the many sequelæ and complications of measles. To the unthinking, they may seem to be unnecessarily severe. The experienced cannot fail to recognize their importance.

**Medicines.**—The sudden onset of fever in association with coryza, lachrymation, photophobia and conjunctival injection, will lead to the administration of *Aconite* in the majority of cases, even before the diagnosis of measles shall have been made.

*Gelsemium* will also suggest itself as a frequent remedy at this period. It presents symptoms similar to those of Aconite, lacking the restlessness of that remedy. The prominent feature in the Gelsemium case is the watery discharge from the nose, excoriating the alæ nasi and the upper lip. There may be associated a hard, barking, croupy cough. As Gelsemium produces an eruption similar to that of measles, it is indicated later in the course of the illness than is Aconite.

The features leading to the selection of *Belladonna* are fever with moist skin, early delirium of an active character, flushed face, and bounding pulse. Such cases are of more frequent occurrence than most of us are aware. The temperature may reach 106° or more, and the whole condition is sometimes such as to cause great alarm in the family. As a rule, the seriousness of the situation is relieved within twenty-four hours.

*Pulsatilla* should be employed after the subsidence of the fever, or, in cases in which the fever is not high, for the relief of the catarrhal symptoms. The coryza consists of watery mucus, or is of a thick greenish-yellow character. The cough is dry at night and loose during the daytime. It is one of the remedies for the otitis media.

*Kali bichromicum* is indicated for about the same line of symptoms as those enumerated under Pulsatilla. The Kali bichromicum case is, however, a more severe one. The conjunctivitis may be complicated by the formation of phlyctenules; ulceration of the meibomian glands, and purulent discharge from the eyes. Otitis media, with discharge of offensive pus; stitching pains, extending from the throat to the ears; cough, with expectoration of stringy mucus; watery diarrhœa with tenesmus. It is an important remedy when the bronchitis is severe, or broncho-pneumonia has supervened.

*Bryonia* is indicated in cases in which the catarrhal symptoms are prominent *ab initio*, the eruption being slow in developing. The catarrhal

inflammation early involves the finer bronchial tubes and even the air vesicles. The patient has a dry painful cough; there is little or no expectoration; the conjunctivæ are inflamed. Sometimes, in the Bryonia case, the eruption does not appear and the child becomes drowsy; the face is pale, and there is twitching of its various muscles.

*Cuprum* and *Zinc* are remedies for the cerebral manifestations. The Cuprum cases present convulsive phenomena. Zinc presents evidences of cerebral irritation, attacks of terrors with profound physical prostration. It has been said that the child has not sufficient strength to develop an eruption.

When, with the imperfect development of the eruption, the patient presents coldness of the surface and other evidences of collapse, *Camphor* should be given in one or two drop doses every half hour until reaction takes place.

Among the special symptoms for which relief must be directly obtained is the **Cough.** For the dry and spasmodic cough—*Drosera, Cuprum, Hyoscyamus, Rumex,* and *Sanguinaria.*

*Drosera.*—Spasmodic cough, worse in the afternoon and evening; coming in paroxysms, sometimes associated with bloody and purulent expectoration.

*Cuprum.*—The cough is associated with cerebral symptoms.

**Special Symptoms.—Nervous Symptoms.**—Attacks of measles sometimes present convulsive phenomena at their onset. In most instances they are of little clinical significance, occurring as would a chill in the beginning of a febrile disorder in an adult. Such convulsions soon yield. Those of severe type require a medicine selected from the following group: *Belladonna, Stramonium, Cuprum, Gelsemium, Hellebore,* and *Arsenic.*

If prompt results are not obtained, the hydriatric remedies mentioned elsewhere or antispasmodic drugs for palliation must be tried. The latter include *Potassium bromide* and *Chloral hydrate* by the rectum, or chloroform by inhalation. As in scarlatina, these long-continued convulsions may excite meningeal hæmorrhage. The application of an ice-bag to the head is often of value.

**Skin.**—Itching of the skin may be relieved by the application of a one per cent. menthol or two per cent. carbolic acid vaselin ointment.

The chronic eruptions persisting after the recovery from the measles are usually of an impetiginous nature. They yield very readily, as a rule, to the ointment of ammoniated mercury, ten grains to the ounce. (*Vide* article on Impetigo.)

**Mouth.**—The mild ulcerations of the mouth which occur during the active course of the disease require mild local antiseptic measures, such as have been already mentioned, especially boric acid, Dobell's solution, and hydrogen dioxide. When the ulceration is especially active, the application of tincture of iodine or nitrate of silver (gr. x–℥j) will be found beneficial.

Noma is a far more serious affair. With its first manifestations active surgical measures are necessary to save life. The best results have been obtained by thorough excision, followed by good supporting treatment in the shape of nourishing liquid foods.

**Epistaxis.**—This requires nothing in the majority of cases. When persistent the bleeding may be checked by injection of water as hot as can be borne, or by plugging of the nares.

**Conjunctivitis.**—The local treatment of the conjunctivitis includes the frequent instillation of a saturated solution of boric acid, the application of cool moist compresses, frequently renewed, to the closed eyelids, and the inunction of the edges of the lids with vaselin or a very weak ointment of yellow oxide of mercury (gr. iv–℥j).

**Otitis Media** requires the same measures as were advocated when speaking of the treatment of scarlatina.

The **Broncho-Pneumonia** and the **Bronchitis** of measles require the same medicinal treatment as will be found described in the chapters devoted to the consideration of those maladies. The remedies most commonly used include *Bryonia*, *Antimonium tart.*, *Antimonium iod.*, *Phosphorus*, and *Kali bichromicum*.

## Rubella.

The danger of sequelæ and death are so remote in cases of rubella that the majority of cases are permitted to follow their course without any treatment whatever. Still, as one never knows when the unfortunate results will occur (and we are all liable to have them), it is the part of wisdom to insist upon reasonable precautions. That this suggestion as to the dangerous character of rubella is not chimerical is demonstrated by Cheinisse,* who regards the disease as a mixed form of scarlet fever and measles. Broncho-pneumonia, angina, adenitis, meningitis, and otitis media have been reported as complications, and in one epidemic occurring in a hospital 8 out of 27 cases died. Isolation of the invalid is good practice, because it saves others the inconvenience of a mild illness. Dyscrasic children should, whenever possible, be removed promptly from the source of the contagium. The invalid should not be permitted to return to school until two weeks after apparent recovery have elapsed. This latter may seem harsh in view of the mildness of the disorder, but we must take cognizance of the feelings of the parents of the well children.

When it is impossible to make a differentiation from measles, the proper course is to act as if the case is one of the more serious disorder.

Notwithstanding the mildness of the illness, the patient should be ordered to bed for a few days, and diet and medicines prescribed according

* *Semaine Médicale*, No. 52, 1906.

to the symptoms present. The medicines ordinarily indicated include *Aconite*, *Gelsemium*, *Bryonia*, *Pulsatilla*, and *Belladonna*.

## Vaccination.

The present work, dealing, as it does, with questions of therapeutics only, is not the proper place for any consideration of the vaccine disease in other relations than as a preventive of small-pox. I shall, therefore, confine myself to the study of some statistics proving the value of vaccination, to the valid answer to the objectors of this great boon to humanity, and to the methods of performing vaccination.

**Evidence Proving that Vaccination is a Preventive of Small-Pox.**—In pre-vaccination times small-pox was regarded as humanity's great scourge. Of it Macaulay wrote: "The havoc of the plague had been more rapid; but the plague had visited our shores only once or twice within living memory. The small-pox was always present, filling the churchyards with corpses, tormenting with constant fears all whom it had not yet stricken, leaving on those whose lives it spared the hideous traces of its power, turning the babe into a changeling at which the mother shuddered, and making the eyes and cheeks of the betrothed maiden objects of horror to the lover." Statistics demonstrated that fully two-thirds of all children born were sooner or later taken with small-pox, of whom about one-eighth died. The average annual death-rate from small-pox in England was 3,000 per million of population. Other countries were nearly equally unfortunate. So far as can be learned, 95 per cent. of the population of European countries suffered from small-pox. In Sweden, there died 2,050 persons per million of population; in Westphalia, there died, from 1776 to 1780, 2,043 per million of population; in Copenhagen, the death-rate from 1751 to 1800 was 3,128 per million; in Berlin, 3,422 per million. In Prague, one-twelfth of the total number of deaths was from small-pox. Vaccination reduced this terrible death-rate to 133 per million in Sweden; to 114 in Westphalia; to 286 in Copenhagen; 176 in Berlin. In Prague, the small-pox mortality amounted to but $\frac{1}{457}$ of the total death-rate.

Again, note the change as to the age of the patients attacked. Whereas, small-pox formerly attacked children, now, by reason of the better protection afforded by vaccination at that time of life, the majority of cases occur in adults. That this change is not a mere coincidence is attested by certain localities where the vaccination of infants has been neglected, the old state of affairs returning. Gloucester was at one time the best vaccinated city in England, but for some reason the practice was neglected, and an epidemic of small-pox appeared. Dr. Sidney Coupland's investigations demonstrated the following:

Of the children in the city under ten years, there were attacked:

26 vaccinated, of whom 1 (or 3.8 per cent.) died.

680 unvaccinated, of whom 279 (or 41 per cent.) died.

Of persons over 10 years of age there were attacked :

1,185 vaccinated, of whom 119 (or 10 per cent.) died.

88 unvaccinated, of whom 35 (or 39.7 per cent.) died.

If vaccination is a true prophylactic, the diminution in the number of children attacked is just what we would expect, for they have been more recently protected. We know that until a very short time past the vaccination of newborn infants was a routine measure, this operation being regarded in some sections of the country as part of the services of the accoucheur, and included by him in his confinement fee.

Coming more directly to the statistics, and taking those where the anti-vaccinationists have made their boasts. There is "naughty Leicester,"* so-called. In the epidemic of 1892–93 :

Of children under 10 years of age there were :

Vaccinated cases, 2 ; deaths, 0.

Unvaccinated cases, 107 ; deaths, 15 (or 14 per cent.).

Of persons over 10 years of age there were :

Vaccinated, including doubtful cases, 197 ; deaths, 2 (1 per cent.).

Unvaccinated, 51 ; deaths, 4 (7.8 per cent.).

Arranging the cases in the same town according to the severity of the attacks :

Of the 199 vaccinated cases :

17 or 8.5 per cent. were confluent ;

20 or 10.1 per cent. were coherent ;

50 or 25.1 per cent. were discrete, and

112 or 56.3 were mild.

Of the 158 unvaccinated cases :

79 or 50 per cent. were confluent ;

36 or 22.8 per cent. were coherent ;

28 or 17.7 per cent. were discrete, and

15 or 9.5 per cent. were mild.

It is useless to multiply statistics, for one and all teach the same lesson. Space forbids quoting further details. Those interested in the subject may consult the *Reference Handbook of the Medical Sciences*, Allbutt's *System of Medicine*, the *Twentieth Century Practice of Medicine*, and Welch and Schamberg's *Acute Contagious Diseases*. We cannot recall one medical author of prominence who has taken an anti-vaccination position.

It was claimed by the anti-vaccinationists that the division of cases into two classes, vaccinated and unvaccinated, is unfair, as the unvaccinated are, for the most part, sickly children ; hence the failure to vaccinate them. Investigation shows such not to be the case.

* At a lecture delivered by an anti-vaccinationist of world-wide fame before the Homœopathic Medical Society of Philadelphia County, there was exhibited a poster containing the following headlines : "Awful depravity. Naughty Leicester. Shocking results following the refusal of the Leicester authorities to obey the compulsory vaccination laws of England." Then followed some alleged statistics.

The greatly diminished incidence of small-pox has been explained by the anti-vaccinationists as due to increased sanitary knowledge among the masses. Analysis of facts do not bear out this statement. In the case of cholera, typhoid fever and typhus, sanitation has done great work as a preventive factor; but not one of these diseases is analogous to small-pox in its mode of spread. Rather we should compare the spread of small-pox with scarlatina, measles and whooping-cough. Increased sanitary advantages should lessen the incidence of these diseases equally. We find, however, that small-pox mortality has decreased 72 per cent., measles 9 per cent., and whooping-cough but a little more than 1 per cent.

Again, what better evidence do we want than the immunity of physicians, nurses and others in small-pox hospitals? Do we find the same classes possessing an equal degree of immunity against the other infections? A study of statistics shows the deaths of medical men from small-pox to be 13 per million, as against 73 per million of the general population; whereas in scarlatina, against which doctors have no protection, there is the remarkable fact that 59 medical men per million die from this cause, as against 16 per million of the public.

As further explaining the occurrence of small-pox in those who have been vaccinated, we find that this little operation is often performed in a perfunctory manner, and that ofttimes little or no effort is made to determine its success. Even when such vaccinations have been made, the presence of a "sore arm," or, as it has been called, "a pseudo-vaccination," has been accepted as the real article.

It is very difficult for me to understand the train of thought followed by the anti-vaccinationists. That they are sincere I am satisfied. One remarkable example of this folly and its unfortunate results came within my own knowledge. A young man employed in a counting-house had as his physician an anti-vaccinationist. He was the only clerk in the place who took small-pox, and the only one who had not been protected by vaccination. Two physicians holding like views as to the utility of vaccination attended him. One of these carried the disease to his wife, who had a mild attack, and to his servant (an Indian girl), who had a severe attack and died. The other carried the disease to his son. About the same time, one of my nurses, who had recently been vaccinated with typical success, visited a friend who had just been taken ill. The two young women slept together. The rash of small-pox developed the following morning. No harm followed this close contact.

Let me here refer to an incident not taken from medical literature: When the Rev. Henry J. Van Lennep, the eminent Presbyterian author and father of Dr. W. B. Van Lennep, was in Asia Minor, the town of Tocat was being decimated by small-pox. Mr. Van Lennep imported some vaccine virus, and with it vaccinated his son. From the scabs thus ob-

tained he vaccinated thousands of natives, not one of whom contracted small-pox ; and thus in an incredibly short space of time he stamped out the disease.

The second objection to vaccination is that it introduces an unhealthy virus into the system. It does introduce a virus into the system, but that it has deleterious effects remains to be proven. There are, of course, certain results in the way of rashes, fever and other symptoms belonging to the vaccine disease, which are at times sufficiently severe to be unpleasant ; but said effects are never permanent. That carelessness on the part of the operator may bring about dire results is certain ; that the use of humanized lymph carelessly selected has done harm we all know ; that carelessness on the part of the manufacturer will do harm is also certain. But no physician should permit himself to be careless, and we believe that very few physicians do. As to the manufacturers, they have too many millions of dollars invested ; and competition is so keen that any laxity is sure to be discovered by physicians who will not hazard their reputations by using such deleterious stuff, and trade rivals will be only too anxious to take advantage of their competitors' mistakes. The same dangers apply in even greater degree to the eating of animal foods, the safeguards surrounding the preparation of which are nothing like as thorough as those used by the manufacturers of vaccines and serums.

We must admit that certain sequelæ of unpleasant and sometimes dangerous character follow vaccination wounds ; but such are the logical results of the lack of care displayed by physicians and patients alike in the majority of cases of vaccination. To one who has had experience in observing other wounds of similar severity the wonder is that accidents are not more frequent than they really are. Before considering these accidents and sequelæ, let us first study the technique of the vaccination operation.

**The Technique of Vaccination.—Selection of the Virus.**—It goes without saying at the present time that humanized virus should not be used. The vast majority of sad accidents in the transmission of disease occurred in the days of "arm-to-arm" vaccination. Of the animal lymphs, authorities now agree that the "glycerinated" is unquestionably the more efficient and the less likely to be contaminated by accidental bacteria. The use of glycerin in conjunction with vaccine virus was first suggested many years ago as a means of diluting the lymph, thereby gaining in quantity of the reagent without impairing its vaccinal efficacy. It was not until 1891 that Copeman announced that glycerin had a more important function, in that by its use it is possible to secure a lymph which shall be absolutely free of accidental germs. Even though the streptococcus of erysipelas has been originally present in the vaccine material, it is rapidly killed by the germicidal action of the glycerin. The only disadvantage of the glycerinated lymph is a thing of the past. Over-confidence in the ability of the glycerin

to kill foreign bacteria led some few manufacturers to be careless in its preparation. This defect has been corrected, so that now physicians are assured of a pure article in all markets.

**The Operation.**—Needless to say, this should be conducted with attention to every detail of cleanliness. To begin with, the patient should, after taking a full bath, don a set of absolutely clean underwear. The latter is a detail more frequently honored in the breach than the observance, especially by those who stand most in need of it. Prior to the operation, the site of the proposed wound should be thoroughly scrubbed with soap and water, rinsed and dried, and again scrubbed with alcohol.

For purposes of scarifying, the operator may use the point of a scalpel or a needle. Many, myself among the number, prefer to do the scarifying with the vaccine point itself. The place usually selected for the operation is over the insertion of the deltoid muscle on the left arm. In the case of female subjects, it is often desirable, for fashionable reasons, to vaccinate on the outer aspect of the thigh just above the knee.

The abrasions made should be very superficial, never sufficient to draw blood. The scarified surface should cover a space about half an inch square. If, perchance, any bleeding has taken place, the operator should wait patiently until it has ceased. The virus should then be well rubbed in, plenty of time being taken for this procedure. If the vaccination has been performed in the physician's office, and it is necessary or desirable for him to economize time, the wound may be covered by a pressed linen shield and held in place by adhesive strips. Otherwise, the virus may be permitted to dry by exposure to the air for half an hour.

The subsequent care of the wound should be the same as we would give any other lesion of like severity. To permit to go neglected, as is done in perhaps three-fourths or more of the cases, is defying Providence and courting disaster. I believe that the shield should be removed after the first twenty-four hours, and a sterile (not antiseptic) gauze compress applied and retained *in situ* by adhesive strips. The shields as a permanent dressing are bad. The pressure they make causes local congestion, and after the vaccination has "taken" they retain the discharges and favor decomposition and local infections. The aseptic gauze dressing has no disadvantage beyond adhering to the sore. This may be obviated in great measure by the application of some simple unguent.

**The Course of the Vaccinal Lesion.**—For the first few days following the vaccination the wound presents no features differing from those of other wounds of like general character. On the third or fourth day, a faint redness becomes visible around the point of inoculation, and this gradually increases and a distinct papule forms. On the fifth day, the lesion changes to a vesicle, occupying the periphery of the inoculated area. This vesicle increases in size and reaches its height on the eighth day. Surrounding

the vesicle is an inflammatory areola, which gradually merges into the healthy skin. Sometimes streaks of redness extend down the arm, and the glands of the axilla become enlarged and painful. It may be that the cellular tissues of the arm take on an active inflammation, but this is exceptional.

Usually mild constitutional symptoms are associated with the vaccine disease, these consisting of slight rigors, fever, some malaise, and poor appetite. As a rule, the temperature does not rise more than one or two degrees, but it is possible for it to attain 104° F. without any complication whatever. This fever rarely lasts more than twenty-four hours.

The lesion usually begins to fade away on the eleventh or twelfth day. The contents of the vesicle, which had been clear, become opaque, and dessication appears in the centre of the pock. Dessication is completed by the fifteenth day; the crust, however, does not fall off until the end of the fourth week.

Exceptions to the ordinary course of the vaccinia may be noted. Thus the "take" may be delayed three or four days; and, on the other hand, precocious cases may be observed, but not more than twenty-four hours preceding the regular time.

**Time for Vaccination.**—In the presence of an epidemic of small-pox, vaccination should be performed at once, no matter what the age of the unvaccinated subject may be. The only contra-indication is ill-health. If circumstances are such that one may make a selection, the fourth or fifth month is generally regarded as the most suitable. *Every individual without exception should be vaccinated during childhood.*

**Revaccination.**—Jenner taught that one vaccination was a protective against small-pox for life. It took a number of years to discover that in this position he was in error. Then it was discovered that after the lapse of time some individuals lost their immunity to small-pox and required revaccination. Such individuals when successfully revaccinated were discovered to be much less susceptible to small-pox than those who had been vaccinated but once. The age at which individuals should be revaccinated has generally been accepted as ten years.

**Spurious Vaccination.**—A number of lesions following vaccinations, mistakenly accepted as "takes," have been observed. A knowledge of these is important, because upon their recognition depends the protection of the individual. Prominent among these lesions is the "raspberry excrescence." This usually appears at a period ranging from three to seven days after the inoculation. It starts as a red elevation, and resembles at this stage the papule of true vaccinia. Unlike it, however, it does not progress to the vesicular stage, but remains hard, dense, and bright red in color, and nodular in form. It remains for several weeks; it is not associated with an areola, and is not followed by a scar. It has absolutely no protective power.

In other cases, vesicles form but run an irregular course. Sometimes the vesicle is conical, and the contents opaque or yellowish and opaque.

Bousquet says: "True cow-pox hardly begins to show itself at the end of the third day; but the false is much earlier, and may be seen from the first to the second day after the introduction of the virus, a circumstance which from the first constitutes a distinction between the two affections. False cow-pox sometimes shows itself as a small pimple, which goes on increasing until the fourth or fifth day. On the sixth or seventh day its progress becomes arrested, it grows pale and dries up. At other times it advances farther, always preserving in its rapid development a conical or globular shape, which I look upon as an unerring sign of false, as the flattening and central depression of the pock are signs specifically characteristic of the true. . . . The false pock is sometimes red and sometimes yellowish. It never assumes the brilliant silvery lustre which distinguishes the prophylactic cow-pock."

All of these false "takes" are absolutely without protecting influence against small-pox.

**The Course of Revaccination.**—As most of the spurious "takes" occur in the revaccinated, it is important that we recognize the characteristic features of successful revaccinations. Persons in whom the first vaccination still retains its protective powers are immune to revaccination. With loss of this, the ability to "take" in a typical manner appears, and is the greater as the immunity grows less by lapse of time or constitutional peculiarities. If the loss is complete, a revaccination will be followed by lesions similar in every particular to the primary "takes." In the majority of cases, the resulting lesion is modified, and has been described as "vaccinoid."

Hervieux, in 1893, described vaccinoid as follows:

"There are three types of vaccinoid, depending upon the extent to which the weakening of the immunity has advanced:

"1. At the point of inoculation there appears a pink papule hardly at all elevated above the surrounding integument, and without any areola; it disappears at the end of a few days, leaving no scar.

"2. There forms an acuminate papule larger than that seen in the first type of vaccinoid, redder, more distinctly visible, surmounted by a little vesicle at its point surrounded by a faint areola, and leaving, after dessication, a little scab, which falls soon without the formation of a cicatrix.

"3. The vesicle is more distinct, the areola is more pronounced, the scab is larger and more adherent, and leaves behind it a cicatrix, which, however, disappears in the course of time. These evidences of vaccinal action are usually accompanied by considerable itching, but there is no fever, and the process confers immunity."

One cannot help reading the above quotations without feeling in doubt as to what constitutes true vaccinoid and spurious results. This doubt is only admissible in cases of revaccination. In the primary cases no doubt is possible. The pock must follow the course outlined on a previous page; no departure from it can be regarded as evidence of a successful result.

**Insusceptibility to Vaccination.**—Every one has encountered subjects alleged to be insusceptible to vaccination. The majority of these are the results of insufficient effort or poor operative technique, attempts at securing a successful result having been abandoned after two or three efforts. In most of the cases of true insusceptibility the individual is immune against small-pox as well. Some of these patients will be found to have but a temporary immunity, as evidenced by a successful vaccination after the lapse of a term of years.

It is the part of wisdom for these insusceptible individuals to regard themselves as liable to take small-pox in cases of exposure. Hence, they should in epidemic times surround themselves with all possible protection against exposure to infection.

## Variola.

**Prophylaxis.**—The value of vaccination as a preventive of small-pox has already been considered, and requires no additional remarks at this time. Instead, we now have to deal with the duties of physicians, nurses and others in attendance upon individual cases of variola. The extreme contagiousness of the disease, the remarkable susceptibility of unvaccinated individuals, the tenacity with which the unknown contagious principle clings to fabrics, furniture, etc., and the great vitality of the supposed germ, demand that those in charge of the patient and the sick-room shall exercise every possible precaution to prevent the spread of the disease to others. The oft-repeated objection to strenuous hygienic efforts that they are unnecessary in view of the efficiency of vaccination, will not excuse negligence in this direction, for it is a well-attested fact that altogether too large a proportion of the community is insufficiently protected, some by reason of their own foolhardiness, others by negligence and ignorance.

Isolation of the patient constitutes the first duty of the physician. If the family cannot give the necessary facilities for this, removal to a special hospital must be insisted upon. If the patient is to be continued at home, the room selected for him should be in a remote portion of the house, and should be visited only by those who are called thence in the performance of their duties. The furnishings of the room should be limited to articles which are absolutely necessary. Their structure must be of the simplest possible, thus enabling their destruction or ready disinfection when the case has terminated. An adjoining room should be utilized for disinfection of all towels, clothing, etc., used by patient and nurses. If this latter pre-

caution is not adopted, the contagious principle will be carried not only through the house but even beyond its confines. The door of the sick-room should be kept closed, and to insure further protection there should be suspended across the doorway a sheet wrung out in a 1:40 carbolic acid solution.

As to the disposal of the remaining members of the family contentions exist. The term "differences of opinion" seems hardly admissible, for if the question is considered without sympathy for those who are inconvenienced, all must agree that every one who has been exposed to the possibility of contagion should be most rigidly quarantined. We have no means of knowing whether or not such persons have already been infected. If, therefore, we allow them unlimited liberty, we know not to what extent they may scatter contagion far and wide. When the patient has been removed from the house, it is undoubtedly safer to insist upon a quarantine of all exposed individuals until the possibility of their having contracted the disease has passed. The compulsory quarantining of such persons is, however, unwise, for we may be sure that the dread of the same will cause those liable to it to adopt every possible subterfuge to escape the supervision of the health authorities. I believe, therefore, that the interests of the community will be best safeguarded if exposed individuals are properly disinfected along with their clothing and domiciles, and permitted to go their ways in peace, providing there is good evidence showing them to have been properly vaccinated within a reasonable time.

The nurses or attendants should make it a rule to wear only such clothing as can be washed and boiled. Attending physicians should visit their small-pox cases at the end of the day, after all other calls have been made. They should make it a rule to wear a specially-prepared overgarment in the sick-room. They should remain in the room as short a time as possible. After leaving, hands, face and hair should be thoroughly washed. Unless impracticable, a special set of clothing should be reserved for making the visit and, during the interim, should be well exposed to fresh air and sunshine.

All persons who have come in contact with the patient should be promptly vaccinated. As to whether such vaccination will be invariably successful does not enter into the case, for we know it will not. What we do know is that a sufficiently large percentage of the persons subjected to the operation will receive protection to make it worth while. The incubation period of small-pox is ten to eleven days; sometimes it is longer. The eruption appears three days later. Vaccination attains its protective influence on the eighth day with the appearance of the areola about the site of inoculation. Hence, it follows that if the exposed are vaccinated sufficiently early, the disease may in many instances be prevented altogether, while in many others its course may be greatly mitigated. The best authorities

believe that vaccination performed within forty-eight hours after exposure will, if successful, protect. Performed later than the fifth day after exposure the result will be *nil*, the lesions of vaccinia and variola appearing side by side and running their special courses unmodified by the association.

**Treatment.—The Care of the Patient.**—However mild the attack, the patient should be put to bed. His room must be kept well ventilated, and must be sufficiently large to give plenty of air space, and at a temperature not to exceed 65° to 70° F. His bed-clothing should be sufficient to make him comfortable. Under no circumstance should he be overburdened with coverings, thus keeping him in a disagreeable perspiration.

The diet should be based upon the constitutional condition of the patient. In very mild cases, with but little fever, solid food of easily digestible character but small in quantity is permissible. But when the fever is more than mild (over 100° F.), milk, soups and broths should constitute the entire diet list.

The medicines which have been found of most value in the initial stage of variola are those which have a direct bearing upon the constitutional symptoms of that period of the disorder, namely, *Aconite*, *Belladonna*, *Gelsemium*, and *Veratrum viride*. The selection of one or the other of this group of remedies rests almost entirely upon the type of fever represented by the case in hand. *Belladonna* has received high praise from Bähr, as being especially adapted to congestive symptoms when present, and is by its pathogenesis indicated in toxæmic states. *Rhus tox.* should be used in those severe cases in which the patient early goes into a typhoid state, with dry tongue, general restlessness, great prostration, etc. Its administration may be continued into the eruptive stage, the above-mentioned constitutional symptoms remaining. As a rule, however, *Baptisia* is better adapted to the eruptive stage in association with typhoid symptoms, especially in the presence of hæmorrhagic manifestations, and a profuse eruption on the mouth and throat.

With the appearance of the eruption, the remedies from which to make a selection in the ordinary run of cases include *Antimonium tart.*, *Thuja*, *Rhus tox.*, *Croton tiglium*, *Apis mellifica*, and *Vaccinium*. Of these, *Antimonium tart.* possesses the confidence of the most reliable observers. To obtain its best effects it must be administered early, even before vesiculation has taken place. It has been employed in severe and mild cases alike. From a symptomatic standpoint, there is no good reason why it should not be indicated by the fully developed eruption. It has been especially praised for the dry, teasing cough which so often attends the initial stage of variola, and is one of the remedies called for in case of complications involving the cornea. *Thuja* owes its reputation almost entirely to the influence of Bœnninghausen, who employed it, one might almost say, as a specific, administering it as a prophylactic, as well as a curative remedy,

even in the advanced stage of the disease. With the appearance of vesicles, *Apis*, *Rhus*, and *Croton tiglium* are indicated, as likely to relieve the intense burning and itching which greatly distress the patient. Cutaneous and subocular œdema are the special indications for *Apis mellifica;* and a dusky redness of the eruption for *Rhus tox.*

With the appearance of pustulation, *Mercurius* and *Hepar* are the main remedies, because of their relation to suppurative processes. At this stage of the disease, as well as during the comparatively afebrile period, the diet must be of a highly nourishing character. Very few persons conceive of the immense drain upon the patient by reason of the suppuration. That it will be appreciated when it is stated that one quart of pus may be discharged daily goes without question. Unfortunately, digestion is at a low ebb, and food must be administered with due care. The addition of raw eggs to the liquid diet of the first stage is therefore demanded.

Hæmorrhagic cases call for *Ammonium carb.*, *Baptisia*, *Crotalus*, and *Phosphorus.*

**Hydrotherapy.**—Prior to the appearance of the eruption, cold bathing as practiced in the treatment of febrile affections generally is advised by all authorities. When, however, it comes to the eruptive stage of the disease, the difficulties in getting the patient in and out of the tub make the bath treatment impracticable, aside from the fact that the utility of the treatment is severely criticized. Something has been claimed for the continuous warm-bath treatment. Hebra was a strong advocate of this method, claiming that by it the softening of the pustules favored the escape of pus and prevented the access of air to the lesions, and thus decomposition of their contents, and lessening the chances of secondary infection. The temperature of the bath should be 95° F. It should be carefully watched, and as soon as it falls to 90° hot water should be added to maintain the standard desired. The patient may be kept in the warm bath as long as desired—many days in fact—without fear. Immermann, likewise, is a strong advocate of the continuous warm bath. The principal objection to the continuous warm bath is the careful supervision required.

Locally, the application of lint saturated with cold water, and renewed at short intervals, the use of mild antiseptic solutions, as boric acid, permanganate of potassium and carbolic acid, have been advised, but the trend of opinion favors the conclusion that the cold water alone accomplishes as much as the antisepsis.

Cool sponging may be employed at all stages of the disease when indicated by the intensity of the fever. If the fever is associated with delirium the cold-pack may be used.

**Stimulation.**—The danger to the patient during the suppurative stage is exhaustion, which is commonly associated with general tremor, subsultus, dry tongue, and delirium. It is unwise to wait for these symp-

toms to appear before instituting measures for maintaining the strength of the patient. With the first evidence of cardiac and systemic failure stimulation should be started. The best stimulant is whisky (which may be given in doses as much as twelve ounces daily), together with proper food, as already outlined. The remedies to be considered include *Camphor*, *Carbo veg.*, *Hydrocyanic acid*, and *Crotalus*. *Camphor* is to be prescribed from the very beginning of a collapsic condition, as indicated by the rapid sinking of the swelling of the cutaneous surface, the pustules drying up, rapidly increasing weakness, and the coldness of the surface. The best results are obtainable from the tincture in drop doses at short intervals. *Carbo veg.* is indicated in cases which have been asthenic from their incipiency. Prostration is excessive ; the breath is cold ; the eruption presents a livid purple color ; and the face is hippocratic. *Hydrocyanic acid* is called for in cases in which the heart's action bears the brunt of the prostration. Hypodermoclysis of a normal salt solution is useful in this as in other toxæmiæ to restore failing circulation.

**Treatment of the Mouth and Throat.**—There are times when the variolous lesions of the mouth and throat constitute a special source of anxiety by reason of the pain excited thereby. Sometimes, also, the mouth and throat lesions are attended by considerable fœtor. In all such cases the use of mouth washes and gargles add greatly to the patient's comfort. We may advise in these cases saturated solution of boric acid, weak solutions of permanganate of potassium, tincture of myrrh, etc. To relieve the pain in the throat, the patient may suck small pieces of ice. If the throat lesions are associated with glandular swellings, the application of hot fomentations externally gives considerable relief. Some cases find great relief of the pharyngeal symptoms from the application of the ice-bag externally. No special remedies other than those indicated for the constitutional condition are required.

The frequent spraying of the throat with a one per cent. solution of cocaine will make deglutition easy. There seems to be no reason for fearing poisoning by this practice, for variola patients are remarkably tolerant of the drug. In fact, E. Pepper made extravagant claims for cocaine as a specific remedy in small-pox, even going to the extreme of suggesting its internal administration as a prophylactic.

Should laryngitis appear, the internal use of ice is to be advised, together with the application of hot poultices to the neck. If œdema of the glottis sets in it may be necessary to perform tracheotomy.

**Treatment of the Nervous System.**—In a general way, it may be said that the delirium and other nervous symptoms of variola are to be treated according to the conditions with which they are associated, rather than in an empirical manner. Sometimes they become so obtrusive as to become a special danger and demand palliation. For this purpose, authori-

ties have advised *Chloral hydrate*, *Potassium bromide*, *Sulphonal*, and other sedatives. I must express myself as sceptical of obtaining reliable results from their use, and state my confidence in the greater reliability of Morphia. Small doses, as the one-eighth of a grain, rarely suffice. It is better by far to begin with one-quarter of a grain hypodermically and watch the result. With very few exceptions, it is perfectly safe to repeat this dose—providing the patient's violence demands it—as often as every six hours. *Belladonna*, *Hyoscyamus*, *Stramonium*, *Agaricus*, and *Anacardium* should be considered as curative remedies. The danger of self-destruction in the mania of variola is unusually great; attendants should therefore never leave the patient alone.

Among auxiliary measures may be advised the application of ice-bags to the head and the warm drip sheet.

**Treatment of the Skin.**—Many have been the measures proposed to limit the extent of the eruption and prevent subsequent scarring. Without exception, they have been alternately praised and condemned by authorities. Antiseptic treatment has utterly failed. I believe that we will do better to have recourse to the simple measures proposed by Stokes, old as they are. He made it a routine practice to apply light poultices over the entire face, or of a mask of lint steeped in glycerin and water and covered with a corresponding mask of oiled silk. He contended that this treatment fulfilled the three fundamental conditions for treatment, namely, the exclusion of air, the keeping of the parts in a permanently moist state, and the lessening of local irritation.

The use of oils, especially olive oil and vaselin, are almost invariably looked upon as beneficial. Some prefer that they be mixed with an antiseptic, as carbolic acid. In those cases in which the oil adds to the patient's discomfort, and there are many such, their use must not be countenanced.

When burning and pain are severe, the best application is cloths wrung out in iced water. Welch and Schamberg recommend that when the pain is severe in the thick skin of the palms of the hands and soles of the feet, greater benefit is attainable by lukewarm hand- and foot-baths; or the frequent application of flannel cloths wrung out in hot water, or the use of hot poultices.

Measures to prevent pitting are many and probably useless. The systematic opening of the pustules is both tedious and impractical. Welch and Schamberg express their confidence in the daily application of tincture of iodine to the face, unless the skin is unduly sensitive. They contend that "the iodine treatment tends to shrink the pustules, to hasten decrustation, and, to some extent, to lessen pitting, although in severe cases it will not prevent it. The liability to consequent pyogenic complication of the skin appears to be diminished. A notable feature of this treatment is that it completely destroys the offensive odor from the areas of the skin to which the iodine is applied."

The red-light treatment as advocated by Finsen and others has not found much favor in the minds of physicians in charge of small-pox hospitals. Indeed, most of them have asserted that it is absolutely useless. Finsen himself, shortly before his death, proclaimed his faith in the value of excluding the actinic rays of light. The treatment is one that at the worst is harmless, and there is no reason why it should interfere with the administration of measures which we know are of value. Its practice is cheap. The non-actinic light can be excluded from the sick-room by fastening the ruby fabric used by photographers over all windows. If one relies upon the exclusion of the actinic rays rather than upon the active therapeutic properties of red light, he may make the exclusion of the same absolutely certain by the use of orange fabric in addition to the red. The materials are cheap, and can be had at any photographic supply house at 50 cents per yard.

**Treatment of the Eyes.**—It is a wise precaution to flush the eyes two or three times daily with a ten grain boric acid solution. To prevent accumulation of secretions the edges of the lids should be well anointed with vaselin two or three times daily. If ocular complications supervene, applications of water as hot as can be borne. In other cases ice-cold compresses give better results. When the conjunctival discharge becomes muco-purulent, the boric acid solutions should be increased in strength (gr. xx—℥j); or the palpebral conjunctivæ may be painted with weak solutions of nitrate of silver (gr. v–℥j). When there is blephorospasmus, it is sometimes necessary to perform a canthotomy. If there is marked chemosis, puncture of the distended conjunctiva will be helpful by relieving the local tension. If ulceration of the cornea appears solutions of atropia (gr. iv–℥j), if the ulceration is central; or eserine sulph. (gr. j–℥j), if it is peripheral. With threatening perforation the edges of the ulceration should be cauterized by a dull hot probe, carbolic acid or trichloracetic acid. Unless there is too much secretion, benefit will be obtained by a well-applied bandage.

**Stage of Dessication.**—With the formation of crusts, the indication is to keep the lesions moist, maintain a dietary suitable to the patient, watch carefully lest any of the crusts be scattered about, and restoration of the patient's strength. The moistening of the lesions by glycerin and water or painting with olive oil or carbolized vaselin favors exfoliation of the crusts at the proper time, and serves to keep them from being disseminated about the sick-room in a dried state. The diet at this stage varies considerably. The physician must be guided by the state of the general health, the condition of stomach and bowels, etc. Foods useful at this stage include corn-starch, milk toast, soft-boiled eggs, custards, etc.

Œdema and anæmia, so common at this stage, are best met by the administration of *Arsenicum* or *Apis;* the prostration or exhaustion by *Cinchona.*

**Treatment of Special Symptoms.—Diarrhœa.**—This demands the ordinary regimen for diarrhœa occurring under other circumstances. The remedies should be those for catarrhal and ulcerative inflammations of the intestines, including *Mercurius cor.*, *Cinchona*, *Arsenicum*, *Cuprum ars.*, etc. Unless sufficiently severe to demand special treatment, it will do well under the remedies suited to the case in hand. The administration of Opium seems irrational, as drainage of the intestines and removal of effete products is demanded; not suppression of peristalsis. If it becomes so severe and exhausting as to demand its prompt cessation, *Tannigen*, in doses of five grains every two hours, will be found efficient.

The **Vomiting** is best met by repeated administrations of ice. Of the remedies suited to variola, *Antimonium tart.* is best adapted to this symptom.

**Headache,** as a rule, requires no special measures. Should it be severe, the ice-bag to the head will give relief. For palliation, acetanilid and caffein, as recommended in the chapter on treatment of headaches in general, may be given.

**Convalescence.**—The patient convalescent from small-pox demands no other measures than those to be observed in fever cases generally beyond the added supervision rendered necessary to keep him from transmitting the disease to others. He is not to be regarded as safe until all crusts have exfoliated, and the underlying patches of skin have thoroughly healed. In the meantime, the greatest care must be exercised lest particles of scab are scattered about the room and even out-doors. Following this period, the patient receives an antiseptic bath, the room and house are thoroughly fumigated, articles used about the sick-room are either disinfected or destroyed, and the physician's duties are at an end.

## Varicella.

(***Chicken-pox.***)

Varicella is such a mild disorder that the propriety of isolation of the patient has been seriously questioned. So far as the protection of the individual members of a family is concerned the question may be settled by the parents. At the same time, it should be remembered that occasionally secondary infections lead to unfortunate scarring and serious complications. More than this, the attitude of the public towards small-pox ofttimes places the adult victim of varicella in a serio-comic predicament. My personal preference stands then in favor of exerting every precaution possible for the prevention of the disease. If the children have taken it let them be isolated, at least from those who have to associate with the public at large.

Cases presenting fever should be kept in bed on a diet consistent with the condition of the digestive system.

The skin may demand special consideration (1) to prevent scarring

and secondary lesions, and (2) to alleviate itching. Much of the scarring is unavoidable; but in the majority of cases it is but slight. By reason of scratching or secondary infection it may be made excessive. To prevent this, the lesions should be treated locally by the application of an ointment consisting of the following:

℞ Carbolic acid, . . . . . gr. x.
Zinc oxide, . . . . . ℥ij.
Unguent. petrolei., . . . . . ℥ss.

To prevent itching, applications of dusting powders, as starch or boric acid, olive oil, or weak carbolic ointments may be made. Scratching is to be regarded as a serious proposition, because it is through it that most of the secondary infections take place.

The occasional occurrence of nephritis as a complication make it advisable for the practitioner to make repeated examination of the urine for albumin. When nephritis occurs it should be treated on the lines already laid down for its management as it occurs in the course of scarlatina.

The remedies adapted to varicella include *Aconite*, *Antimonium tartaricum*, and *Vaccinium*. The gangrenous cases demand *Arsenic*, *Mercurius*, or *Rhus tox.*

## Epidemic Parotitis.

(*Mumps.*)

**Prophylaxis.**—The proverbial innocence of epidemic parotitis or mumps, as it is popularly called, has led to the common practice of inactivity respecting measures looking to the prevention of the disease. So far as children are concerned, mumps is not to be regarded as a serious affection. Nevertheless, accidents may happen, and as unfortunate sequelæ we may have otitis media, permanent deafness, orchitis, mastitis, oöphoritis, vulvo-vaginitis, facial paralysis, meningitis, and insanity. The liability to these complications, but especially to orchitis and oöphoritis, is decided in the cases of adult patients, among whom mumps may well be respected as no trivial disorder.

Physicians themselves differ as to the advisability of isolation. The disease is infectious from its very incipiency, and the danger continues even into the days of convalescence, though in a minor degree. Henoch contends that no efforts at prevention be made. Laveran goes to the extreme view that children should be encouraged to take it, in order that they will be immune in their mature years, when infection may prove a very serious matter. When one considers the inconvenience and suffering to which others may be subjected by the careless management of cases, it certainly seems to be his duty to enforce every precaution possible to prevent the transmission of the disease. Isolation of the patient should be enforced, and should be continued for a period of not less than three weeks after the

subsidence of the swelling; and proper regard for the health of others should make this period four weeks. Especial attention should be paid to preventing the spread of the disease to adults, with whom its effects may be very serious. Following recovery, the sick-room and all clothing and utensils used by the invalid should be thoroughly disinfected. The poison of mumps is very tenacious of life; hence the fumigation must be thorough. It is now admitted that the only efficient disinfecting agents are steam under pressure and formaldehyd vapors.

When mumps break out in camp or barracks, the prophylactic measures should be very prompt and very rigidly enforced. Even then there may be failure to prevent the spread of the contagium. In such cases it is necessary to move the troops to other quarters.

In private practice, it may be impossible to enforce proper prophylaxis, as people will look at the expense attached to it. In institutions, we must disregard the expense item and insist upon the proper course.

**Management of the Patient.**—No matter how mild the attack, the patient should be confined to his room and put to bed. The liability to complications is greatly lessened by this course. He should not be permitted to get up until the swelling has disappeared. This advice should be enforced notwithstanding the absence of fever and other severe symptoms.

The inflamed gland should be covered by some light dressing, as cotton held *in situ* by a flannel bandage. If there is pain, the dressing may be made hot before application.

Special attention should be given the mouth, which should be cleansed three or four times daily with some mild antiseptic solution, as Dobell's solution or equal parts of glyco-thymolin and water.

The diet should be of liquid character until the glandular swelling has disappeared. It should be borne in mind that mumps is not infrequently associated with a catarrhal condition of the gastro-intestinal tract.

If the above advice is followed, there will rarely, if ever, be any fear of complications, sequelæ, or retarded resolution. But people will be careless, especially when the supposed risk is not great. If orchitis supervenes, the affected testicle should be supported by a suspensory or by dressings. If the local pain is great, ice-bags or hot moist applications may be made, according to the benefit they give the patient. The cold applications are best for the first trial. The wearing of the suspensory should be continued for some months after recovery.

Suppuration, though rare, sometimes takes place. It should be treated on the general principles governing the management of that condition, namely, early incision and free drainage.

**Medicines.**—*Aconite*, so commonly indicated in febrile affections, is rarely administered in the early stages of mumps because the fever is rarely sufficiently prominent to lead the physician to be consulted until after the

swelling of the parotid has appeared. It is then that *Mercurius* will be prescribed, unless the swollen gland is quite red and sensitive to manipulation, in which case *Belladonna* is decidedly preferable. The latter remedy, along with *Apis*, is also applicable to those rare cases in which cerebral symptoms are present, or meningitis develops. When there is some œdema over the swelling, *Rhus tox.* is to be administered

Threatened suppuration calls for *Hepar.*

Persistent induration of the inflamed glands, *Conium*, *Baryta iod.*, *Iodine*, and *Sulphur.*

Orchitis calls for *Pulsatilla*, *Belladonna*, or *Clematis.*

Cerebral symptoms, *Belladonna*, *Apis*, *Cuprum*, and *Hyoscyamus.*

## Whooping-Cough.

(***Pertussis.***)

**Prophylaxis.**—The prevailing opinion that whooping-cough is a mild disorder is justified only as applied to the uncomplicated disease, for practically all of such cases make an excellent recovery. Unfortunately, the disease is liable to take on complications or act as a predisposing cause of far more serious affections, of which tuberculosis is by no means the least important. Most of the complications relate to the respiratory tract, and include broncho-pneumonia, bronchitis, emphysema, ulceration of the frænum linguæ, stomatitis, persistent vomiting, diarrhœa, convulsions, intracranial and nasal hæmorrhage, detachment of the retina, and cardiac dilatation. In view of the danger incidental to these various conditions, whooping-cough should be regarded as a serious disease, and every care possible instituted to guard against its dissemination. The argument that children might as well take the disease now as later is a poor one, for the prognosis has a very important relationship to the age of the patient, being the more favorable as age advances. In infants, the disease is to be regarded as especially fatal, mainly, of course, through the incidence of broncho-pneumonia and pulmonary atelectasis.

The only efficient means of prophylaxis is isolation of the patient, which should be maintained for one week after the disappearance of the paroxysms. The disease is transmitted almost entirely by contact with the sick, hence there is little or no danger attached to the sick-room furniture or the playthings of the patient. All necessary disinfection can be secured by thorough airing of the sick-room and the boiling of the bed-linen. The only exception to be made to these directions is in infant asylums, in which there are usually housed many weakly children who are susceptible to the contagium and are especially liable to the complications and to tuberculosis. Under such circumstances, the dictates of humanity demand that the precautions be unusual. Accordingly, the sick-rooms should be fumigated with all the care we would give were the illness diphtheria or scarlatina.

Unfortunately, isolation measures are too often ineffective, because the disease fails of recognition during the initial or catarrhal stage, which is just as dangerous to the healthy as the fully developed disease. It is a wise plan during the periods when whooping-cough is prevalent to look upon all cases of dry or spasmodic cough in children as suspicious.

Fresh air is important both from a therapeutic and a prophylactic standpoint. Nevertheless, it is not advisable to carry this idea to the extent of sending the little sufferers out on the streets or into the public parks, where they must necessarily infect the healthy. It is decidedly wiser to give the patient his airing in his own bedroom. When atmospheric conditions are such as to make it impossible to have doors and windows open or for the child to go into the open air, he should be changed from room to room, to give him a fresher atmosphere.

When whooping-cough occurs in a family, some of whose members are rachitic or weakly from any cause, the latter should be sent away from home, as it is in them that the disease is especially liable to prove serious.

It is needless to say that children with whooping-cough should not be permitted to attend school.

**Hygienic Management.**—It has long been recognized that fresh air and plenty of it is the most efficient measure in the treatment of whooping-cough. But in our desire to benefit our patient we should not order a daily airing in localities where the healthy will be exposed to infection. It is better by far to have the "air treatment" conducted within the patient's rooms. If the family is so situated as to give the patient the airing out-of-doors without endangering others, so much the better.

Valuable as is the open-air treatment, it must not be applied indiscriminately. In warm weather probably all cases are suitable. In cold or damp weather judgment must be used in the case of children who are weakly or who have any involvement of the bronchial mucous membrane.

Dust-laden air is prejudicial. Hence, whenever possible, the whooping-cough patient should be removed to mountain or seashore summer resorts. During the winter, removal to the South is advisable, if the patient is tubercular or weakly.

As a rule, but few special directions as to feeding are required. The great majority of cases do well on the ordinary household diet. Should there be a rise in temperature, the food must be of liquid character, including mainly milk and broths. With the supervention of complications, the diet should be arranged according to their nature. If the paroxysms are frequent and exhausting, the patient is very apt to emaciate. In the latter case, it is necessary to force nutrition, which may be done by giving milk soon after each attack. In the case of older children, any light easily digested food may be prescribed for such occasions.

When vomiting may be persistent and endanger nutrition, when the

child loses his meals after a paroxysm, it is well to feed the patient again and at once, as paroxysms are not likely to succeed one another so closely as to prevent the retention of the second meal. If this fails the patient should be fed by the rectum.

Attention must be paid to the character of the little one's clothing. Woolen garments of weight adapted to prevalent atmospheric conditions must be worn next to the skin. A snugly fitted abdominal binder has been found very efficient in greatly lessening the number of the paroxysms, incidentally shortening the course of the disease and lessening the liability to complications.

Nägeli, quoted by Rühran,* has offered a suggestion as to a simple mechanical measure to stop the paroxysms. "This consists in pulling the jaw forward and downward in the manner frequently employed by anæsthetists. This can be done by the mother or nurse every time the child feels a paroxysm coming on."

**Medicinal Treatment.**—During the catarrhal stage, the symptoms being not at all suggestive of whooping-cough, the medicines prescribed must be the ones ordinarily found useful in the acute catarrhal affections of the respiratory tract, as *Aconite*, *Belladonna*, *Antimonium tart.*, *Ipecacuanha*, *Phosphorus* and *Hyoscyamus*.

The remedies that have been suggested for the treatment of whooping-cough is legion; so many are they that one is forced, notwithstanding the high praise many of them have received, to place but little dependence in any one of them. Certainly, we have no specific. Certain remedies have done much in individual cases. Among our remedies, those which have best withstood the test of experience include *Drosera*, *Naphthalin*, *Belladonna*, *Atropia*, *Mephitis*, *Corallium rubrum*, *Cuprum metallicum* and *aceticum*, *Coccus cacti*, *Castanea vesca*, and *Kali bichromicum*.

*Drosera* has been used very largely in an empirical way ever since the days of Hahnemann. It has been praised by many physicians, some of whom claimed the best results from the potencies, others insisting that the best results followed several drop doses of the tincture. The special features supposed to make its use certain of results include periodically recurring paroxysms, especially worse after midnight; cough in the evening without, in the morning with, yellow bitter expectoration, which the patient has to swallow; vomiting and retching often follow the cough without expectoration; diarrhœa, with stools containing bloody mucus.

*Naphthalin* was first brought into prominence because of the claimed efficacy of the vapors about gas-works on the course of whooping-cough. It was a favorite remedy of the late W. H. Bigler. Goodno uses it in the second decimal potency as his main remedy. Special indications for its administration have not been presented by any author.

* Osler's *Modern Medicine*, vol. ii, p. 40.

*Belladonna* should, by reason of its marked influence over spasmodic conditions in general, have a most beneficial influence on the course of whooping-cough. This drug has in its symptomatology violent constriction in the larnynx; spasmodic cough at night in paroxysms; cough has a rough, hollow barking tone. Belladonna is supposed to be especially indicated by certain symptoms associated with the cough, notably intense congestion of the face and head during the paroxysms, suffusion of the conjunctivæ, photophobia, and involuntary micturition and defecation. Belladonna and its alkaloid, Atropia, are among the few remedies in which any dependence is placed by old-school physicians. Holt advises beginning with a small dose and gradually increasing the quantity, at the same time diminishing the intervals. To an infant, the two years' old, the usual initial dose is one-fourth of a drop of the fluid extract; of Atropia, one eight-hundredth of a grain. These doses are repeated every four hours. The use of Belladonna in whooping-cough has been abandoned by many old-school physicians because of the unpleasant physiological effects. I feel that this is readily explainable by the large doses employed, some recommending as large a quantity as the two-hundredth of a grain. Such doses are capable of producing unpleasant effects in adults, and should do so more readily in young children. It is not unlikely that smaller doses than those recommended by Holt will prove as useful.

*Mephitis* was a favorite remedy of the late Dr. Neidhard. It is especially indicated in cases in which the spasmodic element is paramount and the catarrhal entirely wanting. I have used it with success in the second decimal dilution. Raue also speaks well of it.

*Corallium rubrum* is indicated in cases in which there is a frequently repeated dry cough during the day; it has been described as short, quick, and ringing in character. The paroxysms of whooping appear during the night. Following the whoops, the patient is greatly exhausted.

*Cuprum metallicum* is one of the favorite remedies of Jousset. He gives, as the special indications, the violence of the paroxysms with cyanosis of the lips and face, spasms of the limbs and trunk during the paroxysms; slight twitching of the face. It is the principal remedy in the treatment of convulsions complicating whooping-cough. Other remedies in this latter condition are *Belladonna* and *Opium*.

*Coccus cacti* gives the best results in cases presenting a cough worse in the early morning, with expectoration of yellowish or bloody tough mucus. It is adapted to nervous children; the urine is pale and profuse. Very often the paroxysms terminate with the vomiting of clear ropy mucus.

*Castanea vesca* has been used empirically. As with most drugs of this class, results are obtained only by material doses. My own experience has been limited to a few cases in which the fluid extract was prescribed with excellent results.

*Cina* stands high in the estimation of Jousset, who prescribes it in the fully developed or typical case in "big, fat, and rosy children. Scrofulous children especially are much benefited by this remedy."

**Palliative Medication.**—Of the palliatives, Bromoform enjoys the greatest reputation. It was originally proposed by Stepp in 1889. The following was his formula for administration:

| | |
|---|---|
| Bromoform, | gr. x. |
| Alcohol, | f℥ j. |
| Syr. simp., | f℥ ss. |
| Aquæ, | f℥ ij. |

M. Sig. One teaspoonful every hour.

In favor of this drug is its perfect harmlessness, its ability to reduce the number and severity of the paroxysms, as well as to lessen the liability to such complications as hæmorrhage. Nolden denies the harmlessness of the drug, and reports two cases of bromoform poisoning in the course of whooping-cough.

Another very useful palliative is Heroin, which may be given in doses ranging from $\frac{1}{32}$ to $\frac{1}{100}$ of a grain four or five times a day. The repetition of the dose should be governed by the severity and frequency of the seizures.

O'Dwyer and Norton* have treated 150 cases of whooping-cough by rectal injections of carbonic acid gas. Of these cases, 143 were greatly relieved; but the duration of the disease was not lessened. The treatment is not attended by any unpleasant effects. During the injections the face flushes decidedly, but this disappears in a quarter of an hour. "The method of using the gas is very simple. A wide-mouthed jar, holding a pint or more, is supplied with a perforated cork, through which is a glass tube extending about half-way to the bottom. To the outer end of the glass tube is attached a flexible rubber tube about three feet long, which has at the end a detachable hard-rubber nozzle suitable for rectal injections. The bottle is filled about one-third with water. About six drachms of bicarbonate of soda are dissolved in this, and there is then added about one-half ounce of crystals of tartaric acid. As the tartaric acid dissolves, the $CO_2$ is liberated at the proper rate of administration. The rectal nozzle is inserted and the administration of gas continued as long as desired.

"For all children the treatment was given three times daily, some two or three hours after meals. In infants the treatment lasted five minutes at each seance; in the 'runabouts' ten minutes."

Occasionally one encounters cases in which the severity of the paroxysms, and especially of the spasm of the glottis, endangers life. Under such circumstances it may prove the part of wisdom to perform intubation of the larynx.

* *Twentieth Century Practice of Medicine*, vol. xiv, p. 232.

## Rheumatic Fever.

(*Acute inflammatory rheumatism; acute articular rheumatism; arthritic fever.*)

**Prophylaxis.**—So little being known concerning the etiology of rheumatic fever, but little can be said as to reliable means for its prevention. The most that can be suggested is that persons who have experienced one attack shall avoid exposure to damp and cold, and shall wear suitable clothing according to the seasons. In view of the frequency with which rheumatic fever follows immediately on acute tonsillitis, persons liable to that complaint should have all local affections of the throat cured, in order that infection in this direction may be prevented.

**General Management of the Patient.**—No matter how mild a case of rheumatic fever may be, the patient must be put to bed and kept there for at least one week after pain has disappeared and the temperature has regained the normal. If the case has been complicated by endocarditis, the rest in bed should be prolonged far beyond the above limit, for by so doing the chances of serious valvular mischief will be much lessened.

Special measures are sometimes required to maintain rest of the affected joints. Ordinarily, nothing is required for this purpose, but when the pains are severe and the slightest motion of the body causes excruciating agony, the affected joints may be splinted with advantage, or kept immovable by sand-bag supports, as in the case of fracture of the femur. The enclosing of the joints in plaster-of-Paris bandages is too heroic unless exceptional conditions exist.

The bed should be flat and smooth. Care must be taken that it is not too soft. Under no circumstances is a feather-bed admissible. The patient should lie between light blankets. His clothing should be of woolen. The sleeves and body of his shirt should be cut so as to enable changes to be made with the least possible discomfort. While thus advising adequate covering, the extreme of too much must be avoided as making the patient sweaty and uncomfortable, and necessarily dirty.

The joints should be encased in cotton batting retained *in situ* by pieces of flannel or the roller bandage. Owing to the tendency of the inflammation to spread from one joint to another, it will not do to limit this particular phase of the treatment to joints that are inflamed. Cloths wrung out in hot water or hot fomentations to joints that are especially painful are useful.

The application of small blisters to the vicinity of the affected joints is questionable wisdom. Some speak of it in the highest praise. Osler regards light application of the Pacquelin cautery as more satisfactory. In the great majority of cases these measures are entirely unnecessary.

Sponging of the patient is necessary for cleanliness. One of the prominent symptoms of rheumatic fever is a profuse sour-smelling sweat. The

odor, however, is the result of uncleanliness. It is never observed in hospitals where patients receive efficient nursing. There need be no fear on the part of attendants or family that patients will take cold from the proper use of water, as in frequent sponging or from change of clothing.

**Diet.**—The diet must be of liquids only as long as the fever continues. Milk or milk-toast should constitute the mainstay. Other admissible foods include soups, broths, barley and oatmeal gruel, and arrowroot. Plenty of water is important as favoring elimination. The patient may take lemonade, vichy, soda, effervescent spring waters, and acid phosphate to control thirst. Under no circumstances is alcohol to be administered unless there is great prostration; and this very seldom happens.

During convalescence there should be a gradual return to solid food. A farinaceous diet should be maintained for two weeks after the disappearance of the fever, when animal food may be added to the list. Should anæmia be a prominent feature of the case, feeding must be more generous than it would be under ordinary conditions.

**Specific Treatment.**—Of the medicines that have been proposed as specifics in rheumatic fever, the salicylic acid compounds and derivatives stand most in favor. While excellent results are attainable by them, they are open to objection owing to the undesirable physiological action they exert at times, and their complete failure to effect a cure in others. Their unfortunate physiological action may in great measure be obviated by due care in administration. Enthusiasts have advised too much strenuosity in pushing the drug, leading the uninitiated to the use of doses that are close to the border line of poisonous. *Salicylic acid*, which was the first of the class to receive popular favor, is now but seldom used, as it is comparatively insoluble, and exerts a deleterious effect on the stomach. *Salicylate of soda*, by reason of its solubility and low cost, is generally regarded as the most available of the salicylates. It is inclined to cause gastric disturbance if not given with care. Wood recommends as preferable the *Salicylate of ammonia* as having all the advantages of the sodium preparation, and none of its disadvantages. *Aspirin*, the chemical name of which is Acetylsalicylic acid, is unquestionably superior to any of the other salicylic acid preparations, in that it is efficient and is less likely to disturb digestion or produce tinnitus and other disagreeable symptoms. Its comparatively great cost is the principal objection to it. All of the salicylates are more or less depressing to the circulation. Hence *Salicin* has been proposed as a substitute. While affording most excellent results, it is not as efficient in its therapeutic action as the salicylates. The gastric disturbances following salicylic acid administration may be obviated to a great extent by giving these preparations only when there is food in the stomach, or by following each dose with a free drink of water—from four to eight fluid ounces. *Salol* is not to be regarded as a safe substitute for Salicylate of soda, as it

does not become active until it is decomposed by the alkaline contents of the small intestine. It contains 36 per cent. of carbolic acid, which is then liberated. In the large doses required for the successful treatment of rheumatic fever this carbolic acid may readily do harm.

The most important effects of overdosing with the salicylic acid compounds include tinnitus aurium, deafness, vertigo, and, finally, delirium. They are especially liable to appear in patients with arterio-sclerosis, and in women.

To sum up, the preparation to be used in a case of rheumatic fever should be *Sodium salicylate*, *Salicin* or *Aspirin*. Whichever is selected should be administered with proper precautions. Twenty grains should be administered every two hours until pain is relieved or tinnitus is manifested. Then the intervals between doses should be lengthened to four hours. This dosage may be continued until the temperature is reduced to the normal, when three times daily will be found, as a rule, sufficiently often to maintain the good effects already gained.

The accusation that the salicylates remove the active rheumatic manifestations at the expense of the heart is not borne out by the experience of those who have used them the most. It is the consensus of opinion that the sooner rheumatic fever is controlled the less likely is endo- or pericarditis to appear as a complication. Their depressing influence on the heart is admitted by all; but it is contended that this identical fact is of itself an advantage, as it gives the heart a comparative rest through lessening its activity.

Poynton* expresses himself as entertaining very decided objections to the administration of the salicylates in rheumatic fever. He claims that in cardiac rheumatism in particular they bring with them new dangers and "may turn the scale against the patient." The ill-effects which he alleges he has observed include "general depression, a small pulse, which is sometimes irregular and slow, vomiting, which may be most difficult to arrest, deafness, dizziness, buzzing in the ears, delirium, and occasionally irritation of the kidneys. The gravest and most remarkable of all are respiratory disturbances. In some cases dyspnœa supervenes, with breathing like that seen in diabetic coma, and the patient may collapse and die within twelve hours. . . . In writing thus, the reader will clearly understand that the opinion expressed is neither original, nor, on the other hand, by any means universally accepted."

While I have used the salicylates liberally in selected cases of rheumatic fever, I have never seen any deleterious effects other than tinnitus aurium and gastric disturbances when the drug had been used to the full physiological limit. Again, it has impressed me as an invaluable drug, though by no means a specific, capable of curing all cases. If the drug

* Osler's *Modern Medicine*, vol ii, p. 709.

has done the damage that Poynton declares it is capable of doing, it strikes me that it must have been given very carelessly.

The *Colchicine* treatment of rheumatic fever finds its most earnest advocate in Goodno, by whom the use of the drug was first systematized. He claims for it a curative action fully equal to that obtainable by the salicylates without their unpleasant physiological effects. The class of cases in which it is indicated is exactly the same as that calling for the salicylates, namely, the typical rheumatic fever. To get the best effects from it, it must be administered to the point of toleration; that is, until it begins to produce slight cramps and diarrhœa, when the dosage must be decreased at once. Goodno advises a solution of one grain of Colchicine to the ounce of alcohol. Of this one minim is to be given every hour. This dose may be cautiously increased until the patient is taking as much as five minims every two hours. My experience with Colchicine has not been as favorable as with the salicylates, though at times it has given brilliant results. I much prefer the plan of administering tablets of one-hundredth of a grain of the pure alkaloid three times daily. Even this dose is likely to excite diarrhœa within two or three days after the initial dose. An important factor of the Colchicine treatment is that this drug is incapable of producing the unpleasant disturbances of salicylism.

As an alternative in those cases in which the salicylates, Colchicine, and other remedies fail, we may resort to Carbolic acid as recommended by Moritz Benedikt.* He began his experiments with a 2 per cent. solution, injected subcutaneously about the affected joint. Pain and tenderness promptly disappeared. Subsequently he used the drug in the polyarticular manifestations of rheumatic fever and had equally good results. While the author does not state the quantity of the drug used, trials of it in practice show that the proper quantity about each joint is twenty minims. It seems to have both local and systemic actions. The advantage claimed for the treatment over the salicylates is the absence of tinnitus, deafness, vertigo, and gastric disturbance.

Goodno has taken up this treatment of rheumatism by pure Carbolic acid with great enthusiasm, using only *Merck's pure crystallized Carbolic acid* (loose, not fused crystals). Of it he says:† "During the past year I have treated all my cases of rheumatic fever in the wards of Hahnemann Hospital by means of phenol. The results have been quite surprising to a considerable number of physicians who have observed the cases. The average rheumatic fever is arrested and cured in a most spectacular manner. My method has consisted of daily injections of the phenol near or over the affected joints. The quantity of the drug injected has varied from one to two grains. The treatment has been continued until all acute symp-

* *International Clinics*, 15th series, vol. iv, p. 39.

† *Hahnemannian Monthly*, March, 1907, p. 169.

toms have completely subsided. Several cases developing endo- and pericarditis have received injections over the heart. In every instance the cardiac inflammation has subsided and the patients have been discharged with normal hearts. Regardless of the severity of the case, the pain has, as a rule, been controlled within twenty-four hours and has disappeared within two or three days. In none of the patients treated has there been a return of the disease after its first control. Notwithstanding this, we have kept our patients in bed for at least a week. Persons admitted with advanced attacks require more time for both relief and cure. Those who have had repeated attacks declared that they have never experienced such rapid results before; indeed, the relief has been so remarkable in its rapid development that patients have watched their cases with marked evidence of interest."

**Local Medication.**—The local use of certain salicyl preparations has been recommended. Of these, the *Oil of Gaultheria* has been used most largely. A mixture of Oil of Gaultheria one part and olive oil two parts, on flannel, is applied firmly to the inflamed parts, and is finally covered neatly with oiled silk.

The latest candidate for favor is *Mesotan*. This drug is readily absorbed by the unbroken skin, and it is claimed that by it we are enabled to introduce a salicin compound directly to the lesion. However that may be, Mesotan certainly does bring great relief in many cases. Its injudicious use is capable of producing a rash and salicylism. This may be avoided by simply penciling the parts with a mixture of equal parts of Mesotan and olive oil, and covering with flannel. This should be repeated daily until recovery ensues. A more prompt action can be secured by rubbing the drug into the skin, but in this way we are more liable to excite the dermatitis of the drug. Its special field of action is found in cases in which salicylates are not tolerated by the stomach.

**Relief of Pain by Analgesics.**—The vast majority of cases of rheumatic fever find prompt relief by the proper curative treatment. Hence, special measures for obtunding pain are only occasionally required. The drugs of this class that have been advised are *Antipyrin*, *Acetanilid*, *Phenacetin*, *Exalgin*, etc., and *Morphia*. The latter is unquestionably the most certain in its effects, and I believe, excepting in the case of patients who have an idiosyncrasy to it, it is the safest. As a rule, the dose should be one-quarter of a grain hypodermically, administered at not less than six-hourly intervals. The danger of producing a drug habit is not great, because the necessity for the morphia soon passes away.

**General Medicinal Treatment.**—In fully half the cases, rheumatic fever is efficiently treated and with prompt results by our regular remedies. In the first hours of the disease, when pains are severe, and the patient is excitable and restless, and fever is high, *Aconite* very frequently brings en-

tire relief. This remedy is highly praised by old-school authorities, notably Hare and Ringer, their indications for its use being identical with ours. Hare inclines to administer it in comparatively large doses, securing his favorable results by the depressing effects of Aconite on the circulation, and cautioning his reader not to give the drug except to robust individuals. Drop doses of the tincture or first decimal dilution, every two hours, will give the best results, and are perfectly safe.

The stage for the efficiency of Aconite is very short. With the full development of the disease, *Bryonia alba* becomes, as a rule, a most important medicine. The inflammatory condition shows comparatively little tendency to shift from joint to joint. The affected articulations are considerably swollen by reason of the violence of the inflammation. The symptoms of the digestive tract include great thirst, tongue coated white down the centre, irritability of the stomach, and constipation. Bryonia is the principal remedy for the pleuritic and pulmonary complications of rheumatic fever. Hughes is very positive in stating that Aconite and Bryonia about cover the majority of cases of rheumatic fever.

*Rhus tox.* is suited to cases in which the pains are general as well as in the joints. Swelling of the joints is slight or even absent. The patient is restless, notwithstanding that the movements cause aggravation; but continued motion relieves, or at least does not aggravate. Rhus should also be used in prolonged cases in which typhoid symptoms develop. Damp weather and exposure to cold air aggravate both the pains and the general condition.

*Apis mellifica* is useful in acute articular rheumatism as it is in the chronic varieties. The popular impression concerning the benefit of stings of bees in rheumatism is not without a foundation of truth. In the Apis case, the pains in the affected joints may be of a sore or bruised character associated with numbness, or of a burning or stinging with aggravation on any motion. The effusion into the joints is sufficient to impart a sense of fluctuation to the examiner. The patient often expresses it as "a sensation as if the skin over the affected parts were unduly tense."

*Ferrum phos.* is indicated in the earliest stage of rheumatic fever, when the fever has come on and as yet the joint changes are not prominent. It is readily differentiated from the Aconite case by reason of the absence of the great restlessness and anxiety of that medicine.

*Ledum* is indicated when the smaller joints are involved, and the pains characteristically travel upwards.

*Cimicifuga racemosa* is recommended by Ringer, without giving any specifications as to the type of cases in which it is the most likely to be useful. It can be recommended as especially adapted to cases occurring in young girls at or about puberty, who have or have had chorea. The joints of the lower extremities are principally involved.

*Rhus radicans* is effective for the relief of rheumatic pains in the back of the head.

*Pulsatilla* is called for in those cases of rheumatic fever in which the disposition of the inflammation to jump from one joint to another is well defined. The pains are of a drawing or tearing character. Gastric symptoms are prominent.

*Belladonna* is the most efficient remedy in those cases in which the local inflammations are particularly active. The joints are intensely swollen ; pains are severe and of a throbbing character. In addition, the congestive head symptoms characteristic of this remedy are generally present.

*Kalmia latifolia* is one of our best remedies when the peri- or endocardium is involved. There are sharp stitching pains in the chest interfering with respiration, even sufficient at times to cause dyspnœa. These chest pains sometimes shoot down into the epigastrium and abdomen. There is, as a rule, but little swelling of the affected joints ; fever is mild ; weakness is well marked. The pains are principally in the legs and are of a tearing character.

*Bryonia* and *Spigelia* are additional medicines for the cardiac complications of rheumatism.

During the convalescent period, rest, fresh air and mild climate are the important therapeutic factors. The old notion that animal foods are prejudicial is a mistaken one. In view of the anæmia, food that is of nutritious quality and easily digested is necessary. Of course, care must be taken not to overfeed. It is not unusual for cardiac lesions to exist without the presence of a murmur. Hence, it is wise to enforce comparative rest for at least two months after recovery. This precaution will greatly lessen the frequency of organic valvular disease in after years.

**Hyperpyrexia.**—The hyperpyrexia of rheumatic fever is a most dangerous condition, against which we have but one efficient remedy, namely, the cold bath. No fear need be entertained of any serious effects from the measure.

## Diphtheria.

**Prophylaxis.**—Isolation of the mildest cases, as well as those whose illness is sufficient to force them to bed, is absolutely necessary for the safety of the healthy. Other children in the household should, if possible, be sent away after receiving an immunizing dose of antitoxin. The usual precautions governing the management of the sick-room in cases of contagious disease must be enforced. In the case of diphtheria, it is to be remembered that the specific danger lies in the discharges from the nose, throat and mouth. To these then our attention must be directed with ever-watchful zeal. *All discharges from the mouth, nose and throat must be collected in rags or handkerchiefs.* It is better that suitable muslin rags be used, for they can be destroyed immediately by burning. If handkerchiefs

are used they must not be permitted to become dry, but must at once be immersed in carbolic acid solution of 2 per cent. strength. They should be permitted to remain there for two or three hours, after which they should be boiled for one hour, and then washed.

The same rigid supervision over other fabrics used in the sick-room is necessary.

The physician must provide against infection of his person or clothing while examining the patient's throat, for this accident is not infrequent by reason of mucus and pieces of membrane coughed up at such times. He should therefore be provided with a special garment, preferably a long duster, which should be put on and carefully buttoned close to the collar before entering the sick-room. After leaving the room, it should be taken off and hung by the doorway or in an open window, ready for use at subsequent visits. With the termination of the case, the garment must be efficiently disinfected by carbolic acid solution, boiled and washed, before removal.

The physician should also make it a regular practice to wash his face and hands after leaving the room. If he has been sufficiently unfortunate to have any of the discharges coughed upon him, the use of a disinfectant, as carbolic acid or mercuric chloride, is imperative.

The nurse and others who come in contact with the sick must not be permitted to mingle with the outside world. The remaining children of the household, even though they have been taken to the homes of friends or relatives, should not be permitted to attend school until sufficient time has elapsed to make it certain that they have not acquired the disease.

**Immunization by Antitoxin.**—Physicians and nurses in attendance upon diphtheria patients, as well as the entire household, should have immunizing doses of antitoxin administered to them. Even though the physician may not feel that he is in danger, he should submit as an example to others and in justice to his family and other patients.

The dose of antitoxin for purpose of immunization should range from 100 to 500 units. This, if given within twenty-four hours after exposure to infection, is nearly always successful in warding off an attack of diphtheria. The immunity thus conferred continues for a period of about four weeks. When, in asylums or homes for children, there exist simultaneous outbreaks of measles and diphtheria, and it is essential to institute vigorous measures for preventing the spread of the latter disease, the patients suffering from measles should receive the immunizing dose along with the others. It must be remembered that such subjects, however, do not have an immunity to diphtheria of as long duration as in the case of healthy children, the beneficial effect in measles patients lasting but from 18 to 21 days. It is therefore wise to immunize every two weeks in the presence of a measles epidemic. No danger is attached to this practice, as the antitoxin is in measles patients, as in healthy subjects, perfectly harmless.

The beneficial effects of immunization by antitoxin is shown by the results obtained in four infants' homes in New York City; 1,043 cases were immunized. Of these, 3 developed diphtheria within 1 to 30 days; 4 within twenty-four hours, and 13 after thirty days; 67 cases appeared in these institutions prior to the stamping out of the disease by antitoxin. Of the 20 cases occurring after antitoxin, 17 occurred at such times as to show them to be without the pale of benefit by the treatment, namely, the 3 occurring within twenty-four hours after injection, and the 13, thirty days afterwards, when the immunizing influence of the antitoxin had been lost, and probable additional exposure to diphtheria had been incurred.

"Morrill,* in the Children's Hospital in Paris, reports that of 1,808 children immunized at least every twenty-eight days with 150 to 500 units of serum, 7 had diphtheria, 3 from insufficient dosing, 2 within twenty-four hours after injection, and 2 in twenty-two and 2 in twenty-three days. Of 829 who had not been given antitoxin, or in whom more than twenty-eight days had elapsed after the injection, 9 had diphtheria."

For immunizing purposes, the dose of antitoxin must be regulated according to the age of the subject. From 100 to 300 units should be administered to very young infants, while older children and adults should receive from 300 to 500 units.

While everything is to be expected from immunization by antitoxin early performed, other measures designed to lessen the opportunities for infection must not be neglected. Such measures, however, should be in vogue at all times, and include fresh air, sunny and well-ventilated rooms, and attention to post-nasal adenoids.

Corpses of diphtheria patients should be washed with a solution of chloride of lime in the proportion of six ounces to the gallon of water.

After termination of the case, the sick-room should be disinfected by burning sulphur, from three to five pounds being employed for every 100 feet of air space. In most communities, the matter of disinfection of rooms after diphtheria is taken in hand by the health authorities, thus relieving physicians of the responsibility of supervising this important function.

I believe it the best course to fumigate the entire house. Quite recently, I treated a child of 22 months, who had had an attack of diphtheria 10 months previously. There were no other cases of diphtheria in the suburb, nor had there been for months, and the patient had never been more than 300 yards away from home. Disinfection of the sick-room in the first place was supposed to have been thorough. It is readily conceivable that another portion of the house had been infected. After the second attack, the fumigation by the Board of Health was extended to the entire building, all furniture of the sick-room was scrubbed with bichloride, toys

* Nothnagel's *Encyclopædia*. Article on Diphtheria, p. 128.

and books were burned or sent to the Municipal Hospital, and all clothing was boiled.

The rule of the health authorities of most places that diphtheria patients shall not be permitted to mingle with the world at large until at least two cultures from the throat show no diphtheria bacillus is a good one, though it may work apparent hardship at times. Certainly, the patient should not be considered as out of quarantine until three weeks after the membrane has disappeared from the throat. It is not uncommon, however, for cultures to show a positive reaction for many weeks. In such cases, systematic spraying of the throat with Dobell's solution, Hydrogen dioxide, Listerine, Glyco-thymoline, and like pharyngeal antiseptics will hasten the disappearance of the bacilli. If the child is not a refractory one, the spraying may be repeated as often as every two hours.

**Antitoxin Administration.**—I have placed the administration of antitoxin first in the treatment of diphtheria patients because experience has taught me its efficiency, and because the results are so much better when it is administered early. I believe it to be useful in all cases as long as the symptoms of the disease are present, and cannot agree with those who contend that the mortality is not diminished after the disease has existed more than three days. In any stage, it will give battle royal to the diphtheria toxin ; but when the case has progressed to a point at which mixed infection has taken place, its utility must necessarily be limited, for it has never been contended that it was anything more than an antidote to the diphtheria poison.

The preferable locations for antitoxin injections are the loose connective tissues of the small of the back, the infra-axillary region of the chest, the thighs and the abdomen. The skin over the site selected should first be thoroughly scrubbed with soap and water. After drying, it should be well rubbed with alcohol. The possibilities of secondary infection demand that the injection be carried out with the utmost attention to cleanliness. There was a time when cleanliness of the syringe used was a matter of careful detail. Fortunately, the manufacturers have devised cheap syringes which are furnished with each bottle of antitoxin, and which are to be thrown away after a single use. The site of injection should always be covered by a small pad of antiseptic gauze held in place by a strip of adhesive plaster.

When possible, concentrated antitoxin should be used, as furnishing less bulk and diminishing the liability to secondary rashes and arthritic complications.

The dose to be employed must be decided by the severity of the case, the particular organ invaded, and the length of time the disease has existed. *The age of the patient is a factor of no account whatever.*

Inasmuch as the antitoxin is administered with the design of neutral-

izing the diphtheria toxins within the body, and as the latter is always an indeterminate quantity, it is impossible to define the proper dose of antitoxin with accuracy. As the remedy is harmless—certainly so in reasonable doses—we should make sure of one thing, namely, that we give enough. It is better by far to give too much than too little. For cases of ordinary severity coming under treatment early, from 1,500 to 3,000 units will prove sufficient. In severe cases, or in those in which the pseudo-membrane involves the nasal cavities or larynx, or both, from 3,000 to 5,000 units—usually the latter—will be required. Cases coming under treatment after two or three days should receive larger doses. The effects of the injection on the local lesions are almost invariably as prompt as they are gratifying. If the disease shows a disposition to spread after twelve hours, the dose should be repeated, as it should also if there is not marked improvement within twenty-four hours.

The extravagant doses of 20,000 to 30,000 units advocated by some authorities seem to me unnecessary. In the vast majority of cases two injections are sufficient to effect a good result, though I would not hesitate to push the drug if symptoms did not show a prompt abatement.

Since the technique of antitoxin manufacture and administration has greatly improved of late years, the results from the administration are much better than formerly. It can be said with safety that, taking all cases treated by it, the mortality of diphtheria is reduced by 70 per cent. Moreover, laryngeal diphtheria is much less frequent, and when it does occur, operative interference is demanded less frequently ; and a much larger proportion of tracheotomy and intubation cases are saved. Age is a very important factor in the prognosis. Even though our therapeutic methods have advanced, we still lose altogether too large a proportion of our cases of infantile diphtheria.

To those who have used the antitoxin treatment of diphtheria the opposition to it is extremely puzzling. That any one should declare it to be useless almost passes comprehension. Its opponents charge it with serious results in the direction of increased number of sequelæ, notably paralysis and heart failure.

It must be admitted that more cases of diphtheria now die of heart failure than formerly ; also that post-diphtheritic paralysis is more frequent. We believe this increased frequency is explainable on the hypothesis that many serious cases which formerly died of the diphtheria toxæmia now live, and thus afford the subjects for the above-mentioned sequelæ. In only two of my personal cases did cardiac complications occur, and in both evidences of failing heart were present prior to the injections. In one case the patient died suddenly one week after the disappearance of all throat and laryngeal lesions ; the other one made a very satisfactory recovery. As to post-diphtheritic paralysis, I have not yet observed a case after the antitoxin treatment.

Unpleasant symptoms are known to result from the antitoxin injections. Those of special interest are the fever, the exanthemata, and joint pains. The temperature elevation occurs with comparative regularity, but is likely to escape observation unless temperature records are made every few hours. It is very evanescent and unimportant.

The antitoxin exanthemata are quite varied and harmless. An extended description of them is unnecessary. The worst that can be said of them is that they are very annoying.

The joint pains occur much less frequently than the antitoxin rashes. They usually invade the large and middle-size joints, as hips, shoulders, knees, elbows and wrists. Sometimes the pains are very severe, requiring special measures for their alleviation. As a rule, they are not attended by any local evidences of disease; but in some cases the affected joints are swollen, and exhibit slight redness and heat.

The exanthemata and arthralgias are now known to be due to the horse serum itself, and not to the antitoxin. They are apt to be more pronounced as the quantity of serum used is large. For this reason, it is very important to employ the concentrated antitoxins whenever obtainable. It is said that the serum of some horses is much more active in this respect than others.

These untoward effects dependent upon the horse serum are really a more serious matter than at first sight appears. While no permanent damage has thus far been done to any patient, they cause the unthinking portion of the profession and community to take an antagonistic position as to the use of antitoxin, with the result of losing many lives which might otherwise have been saved. One of the largest manufacturers of antitoxin, taking advantage of the fact that the antitoxin is contained in the globulin serum, precipitates the latter with ammonium sulphate solution to about 33 per cent. saturation. The precipitated globulin antitoxin is then separated from the serum-albumen and other soluble substances by filtration and dissolved in concentrated salt solution.

From this salt solution it is re-precipitated by the addition of a small amount of acetic acid.

The purified globulin-antitoxin is then separated by filtration, dried between filter papers, placed in parchment dialyzers and carefully dialyzed in running water to free it from adhering inorganic salts.

When placed in dialyzers the globulin-antitoxin is a white, waxy mass, which gradually liquefies during dialysis to a clear fluid.

This clear fluid is passed through several layers of sterilized filter paper, then twice through Berkfeld filters, and then standardized in the same manner as that used for standardizing antitoxic serum.

Experience thus far gained shows this preparation to be as efficient as the regular antitoxin, and far less liable to produce urticaria and other cutaneous lesions. Time alone will determine its influence in preventing the

arthritis, for joint lesions are rare. I have seen them only in one case, and then the antitoxin was furnished by a Board of Health.

Prior to the introduction of the antitoxin treatment of diphtheria the measures in vogue included local devices intended to keep the diseased parts clean by means of purely cleansing agents or antiseptics, or both, and constitutional measures, including medicines and stimulants.

**Local Treatment.**—There can be no question as to the propriety of such local treatment as may be necessary for the removal of discharges and portions of loose membrane, for by it we most unquestionably reduce the chances of additional infection. The efficacy of local antiseptic applications, on the other hand, is well open to debate. The general trend of opinion favors the idea that everything in this direction can be accomplished by irrigation or swabbing of the affected parts by normal saline solution (0.6 per cent.). Especially is cleansing treatment necessary when the membrane involves the nasal cavities. When the lesions are limited to the fauces and pharynx, simple gargling with saline solution or weak solutions of potassium permanganate (1:250) is all sufficient in adults and children old enough to perform this act. In younger subjects, any efforts in this direction must have their benefits greatly lessened by the struggling and resistance on the part of the little sufferer. In many of these cases, it is the wisest plan to desist from all local interference.

Of the antiseptic applications advised, two formulæ have attained considerable popularity. These are Lenox Browne's *Lotio Hydrargyri Biniodidi* and *Löffler's Solution.* The following is the formula of the Lotio Hydrargyri Biniodidi:

| | |
|---|---|
| Red iodide of mercury, | gr. ¼ |
| Iodide of sodium, | gr. ¼ |
| Water, | fl. ℥j. |

Löffler's solution consists of the following:

| | |
|---|---|
| Menthol, | 10 grammes. |
| Solve in toluol ad, | 36 cc. |
| Absolute alcohol, | 60 cc. |
| Liquor ferri sesquichlor., | 4 cc. |

Whichever of these solutions may be selected is applied by a swab every four hours over the diphtheritic patches. In the case of the mercuric iodide solution, part of it is necessarily swallowed; hence, in the case of children, it is wise to dilute it with four to nine times its bulk of water, thus making its strength 1:5,000 or 1:10,000.

Inhalations of steam are generally regarded as of value. The theory upon which their adminstration is based is that they set up suppuration beneath the false membrane, thus hastening its separation. The micro-organisms, moreover, are attacked by the rapidly forming pus corpuscles.

Spraying of the parts with solutions designed to dissolve the membrane have been used. Of this class, the best is:

| | |
|---|---|
| Pancreatin, | gr. xxx. |
| Soda bicarb., | gr. x. |
| Distilled water, | ℥j. |

In the case of nasal diphtheria, one may use, instead of the saline solution for irrigation purposes, a boric acid solution of the strength of five grains to the ounce of water. If epistaxis ensues, irrigation must be abandoned. If the nose-bleed is persistent the following formula may be used:

| | |
|---|---|
| Potassium chlor., | |
| Soda bicarb., | |
| Borax, | āā ℥ss. |
| White sugar, | ℥j. |

Dissolve one drachm of this in five to ten ounces of water at a temperature of 105°F., and inject with a nasal syringe.

**Diet.**—The food of a diphtheria patient must be liquid, nourishing and easily assimilable. The best articles include milk, broths, beef-tea, cream, junket, eggs with milk, and egg-nog. The patient must be fed every two hours. The quantity given at each feeding must be governed by the readiness with which the patient takes nourishment, and the strength of his digestive functions. It is desirable to give as much nourishment as possible without overtaxing the patient's stomach. When cardiac weakness is threatening, the patient must use the feeding-cup and be fed by the nurse in a recumbent position.

Alcohol in the shape of whisky or brandy is important in the majority of cases, even in those which are apparently mild. For an infant, from ten to fifteen minims should be prescribed three or four times daily. A child of five years should receive one ounce in the twenty-four hours.

When, in the course of post-diphtheritic paralysis, deglutition is seriously involved, all food must be administered through the œsophageal tube, three times daily. Rectal alimentation is rarely satisfactory in these cases. In very young children, the stomach tube should be introduced by way of the nares. Gavage is sometimes necessary in patients who have been intubated, because of the paroxysms of coughing excited by attempts at swallowing; it may also be advisable when toxæmia is profound and feeding in the natural way is impossible. In the majority of cases, the use of tubal feeding can be abandoned after two weeks.

The patients may be permitted water *ad libitum*. Mildly acid fruit juices are often grateful. The sucking of small pieces of ice ofttimes adds greatly to the patient's comfort.

**Medicinal Treatment.**—Of the medicines used internally in the treatment of diphtheria, the preparations of mercury enjoy a larger degree

of confidence by the physicians of all schools of medicine than do any other drugs. *Mercurius biniodid.* is the favorite routine remedy with most practitioners of our school, being administered for the most part in one grain doses of the second decimal trituration at two-hourly intervals. It is especially indicated when the membrane is of a yellowish-gray color. Glandular enlargement is present. Theoretically, the red iodide has been recommended when the predominance of lesion is on the left side of the throat; the yellow iodide (*Mercurius protiod.*) being reserved for cases in which the right side bears the brunt of the disease. The fact that our physicians are satisfied with the action of the biniodide, to the exclusion of the protiodide, would seem to indicate that any therapeutic differentiation of the two preparations is not of much practical importance.

*Mercurius cyanatus* should be administered in cases of a malignant type. Prostration is marked, and the pulse is rapid (130 to 150) from the inception of the illness. Vascular pressure is low. Glandular swelling appears early. The pseudo-membrane is of a dark color. The tongue is brown or even black. Nasal and laryngeal involvements are additional indications; nose-bleed which persists, the blood being of a dark color, with diminished coagulability; harsh, barking, croupy cough with dyspnœa. Ordinarily, one grain of the third decimal trituration, administered every hour, is the proper dose. But that it can be given with benefit in larger quantities is shown by some old-school authorities, who recommend it in doses of one-fiftieth to one-hundredth of a grain every three hours.

*Mercurius corrosivus* is the mercurial preparation most in vogue by the old school. Hare advises it in doses of one-fiftieth of a grain administered every hour until symptoms of diarrhœa or ptyalism are manifest, when it should be discontinued. It is indicated in cases in which the subjective symptoms are prominent, the patient complaining of severe burning pain with great sense of constriction, aggravated by pressure. Attempts at swallowing provoke spasmodic contraction of the pharynx and ejection of the food or drink. The best dose is one grain of the second decimal trituration every two hours. Diphtheria patients seem to tolerate relatively large doses of mercuriul preparations without exciting physiological action.

*Apis mellifica* is employed as an anti-diphtheritic by homœopathists exclusively. While the general and local symptoms of the drug indicate its value, it is administered almost exclusively upon the latter set of indications, its special symptom being œdema of the tissues of the throat, extending even to the glottis. The throat is usually of a pinkish-red color. Hughes, on the contrary, regards it as better indicated when the throat is of a purplish red. Fever is noteworthy for its mildness or even entire absence. Prostration is well defined. The pains in the throat are of a stinging character. There is sometimes an associated scarlatiniform rash on the surface of the body.

*Phytolacca decandra* is indicated in a class of cases which in former years was classed as catarrhal; that is to say, the systemic intoxication was absent, as was also fœtor of the mouth and throat. Usually such cases begin with generalized pains, high fever, and chills. The membrane is pearly- or grayish-white; occasionally, it may be a brownish yellow. The mucous membrane of the throat is a dark red, almost purple. Burt and Hale recommend the employment of the first decimal dilution of a tincture made from the fresh root, thirty drops being dissolved in four ounces of water, and two teaspoonfuls being given every one or two hours. Hughes also advises the local use of the drug as a gargle.

*Cantharis.*—The reputation of this drug in diphtheria is apparently based upon mere theory. Drysdale, Neidhard, Okie, Farrington, and others have spoken favorably of it under certain limitations. The indications for the drug, namely, "the appearance as if a blistering fluid had been applied to the throat," must certainly be of rare occurrence. Farrington gives as its indicating symptoms in diphtheria as well as in other throat affections a hyperæsthesia, especially to fluids, resulting in spasmodic ejection of the same on attempts at swallowing.

*Kali bichromicum.*—This is probably the remedy from which the most can be hoped in laryngeal diphtheria. As Hughes expresses it: "In laryngeal diphtheria it does all that medicine can do, which, unhappily, is not much." In the Kali bichromicum case, manifestations of toxæmia are usually absent. The prominent clinical features are those characteristic of laryngeal diphtheria, namely, the croupy cough and the obstructive dyspnœa. The membrane in the throat is thick and yellow. The discharges from the nose, mouth and throat, are thick and stringy. The nasal discharge, in addition, is yellow and excoriating. Hughes is very optimistic concerning its value in nasal diphtheria, going to the extreme of denominating it a specific for that condition. Its best results are obtained in doses of two grains of the 2x trituration every hour.

*Bromine*, *Iodine*, and *Spongia* have all been recommended in laryngeal diphtheria. The testimony in favor of Bromine and Spongia is not satisfactory, however useful they may be in theory. These remedies are far better adapted to the catarrhal laryngitis of children. That they can accomplish much, if anything, in diphtheria of the larynx is very doubtful. Iodine is praised by Goodno, who recommends one-drop doses of the tincture well diluted.

*Lachesis* is indicated in cases in which the toxæmia is profound. The general prostration is great; the heart is weak in its action. The throat is very sensitive to external pressure. There is widespread glandular involvement.

*Liquor calcis chlorinatæ* was the favorite remedy of Neidhard. In two severe cases it apparently did all that was desired. But in all other cases in which I have tried it, it has been a signal failure.

**Post-Diphtheritic Paralysis.**—During the initial stages of post-diphtheritic paralysis, whether general or local, *Gelsemium* is the best remedy. For prolonged cases, *Aurum mur* 2x or *Argentum nitricum* 3x will prove efficacious.

**Threatening Cardiac Paralysis.**—Although cardiac tonics have been highly lauded in cases in which this accident is impending, I have but little faith in their value. It is hard to see how they can be of much use. It is simply the case of whipping a tired horse. It is better by far to save the heart to the fullest extent by a stringently enforced absolute rest, the patient being saved the slightest exertion. If stimulation is necessary, I would prefer to depend upon alcohol or strychnia to the exclusion of other medicines. The Strychnia should be given in doses of one-sixtieth of a grain four times daily. Caffein in doses of one grain four times daily may be also suggested.

If a sedative is necessary in the course of diphtheria, the danger to the heart must ever be borne in mind. Hence, such remedies as chloral, bromides, sulphonal, chloralamid, trional, etc., are not to be considered. It is better by far to depend upon morphia hypodermically, in doses graduated according to the age of the patient. If the physician fears that it may depress the heart, which it is not likely to do, he may combine it with one-sixtieth of a grain of strychnia.

## The Treatment of Laryngeal Stenosis.

By C. Sigmund Raue, M.D., Clinical Professor of Pediatrics, Hahnemann Medical College, Philadelphia, and Fred. W. Smith, M.D., Assistant Medical Inspector, Philadelphia Board of Health.

Since the introduction of antitoxin in the treatment of diphtheritic infections there has been a most decided decrease in the number of cases of laryngeal stenosis, which were formerly quite frequently encountered. Nevertheless, even in spite of the use of antitoxin, laryngeal stenosis does occasionally develop; and, furthermore, there are still a number of physicians whose disbelief in the value of diphtheria antitoxin leads them to neglect its early use in their laryngeal cases. In consequence of such neglect stenosis is the inevitable result in almost all cases of this nature. Operative interference for laryngeal stenosis has therefore by no means become obsolete, and we must still be prepared to meet this emergency. There are two methods of mechanical interference for the relief of laryngeal stenosis, namely, *intubation* and *tracheotomy*. Which of these methods shall be employed in a given case is by no means always as simple a matter to decide as it may appear at first hand. Undoubtedly intubation possesses many advantages over tracheotomy. In the first place, it is a bloodless operation and requires no anæsthetic; secondly, statistics, based on a long series of cases, show a decided difference in the death-rate between intubation and

tracheotomy in favor of intubation; thirdly, it may be said that the after-treatment in cases of intubation is less troublesome than in tracheotomy, and that there is not the protracted convalescence caused by the open wound; fourthly, broncho-pneumonia is not nearly so likely to occur in a child that has been tubed as in one that has been tracheotomized. On the other hand, it must be admitted that to the average practitioner who has had some surgical experience, but who has never paid especial attention to acquiring dexterity in intubation, tracheotomy will prove a less difficult operation, and he may be able to save a life by tracheotomy where he would not have been successful if he had attempted intubation and failed to properly place the tube. Again, there are cases in which on account of the excessive development of membrane (and this is especially the case in secondary laryngeal diphtheria) that intubation will fail to relieve the stenosis. Sometimes, also, in purely primary laryngeal cases, the membrane will reach so low down into the trachea that the intubation tube fails to overcome the obstruction. In two of our cases this contingency presented itself, and, had we not been prepared to perform tracheotomy at once, the child would have died of suffocation. For this reason it has always been our rule of practice never to go out to intubate a case without being fully prepared to perform tracheotomy should intubation prove unsuccessful. Fortunately, however, these cases are the exception. Another disadvantage of intubation in private practice is the possibility of the child coughing up the tube and suffocating before the physician can reintroduce it. It is well to remain with every case, or at least within calling distance, for several hours after intubating, so that, should the child cough up the tube, prompt action may be taken. Where a child persistently coughs up the tube we should, if at all possible, remove it to a hospital, where skilled residents are in constant attendance. Death may result under somewhat similar circumstances, even after tracheotomy, for the child may pull out the tube, or it may become clogged with membrane. We will first describe the operation for intubation.

**Intubation.**—Intubation consists in the introduction into the trachea of a hard rubber tube by means of an especially constructed instrument invented by Dr. Joseph O'Dwyer, of New York, in 1880. This introducer is practically nothing more than a handle, to the end of which, at a right angle, the tube is temporarily fastened by being slipped over an obturator. From this the tube is released at the proper moment by means of a hook-like arrangement that is pressed down over the collar of the tube. The removal of the tube from the larynx, or *extubation*, is performed by means of a long curved forcep-like instrument with a small beak, as shown in the accompanying illustration (Fig. 1). The beak is inserted into the opening of a tube, after which the blades are separated, until the tube clings to them, whereupon it may be withdrawn from the larynx. As to the position in which the child should be held while performing intubation, this seems to

be a matter of personal choice with different operators. As originally performed by O'Dwyer, and still followed by his many admirers, the upright position has claimed for it many advantages. The operator is enabled to seat himself before the patient with the same ease and the same habit observed in performing any other operation upon the throat. He can follow every step of the operation, and has no difficulty in maintaining the median line, so essential in any operation upon the larynx. To properly maintain the upright position, however, at least two assistants are necessary; while, if we

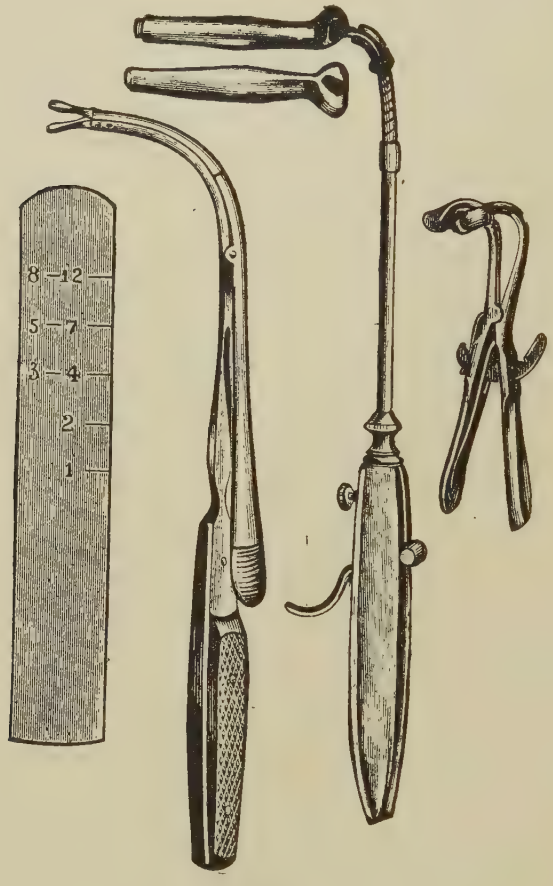


FIG. 1.

employ the recumbent position, which we personally prefer, and which is being used in most of the hospitals for diphtheria, the child can be better managed, and this position offers the additional advantage of allowing the soft palate to fall away from the base of the tongue, thus giving a little more room in the throat for the exploring finger. Whichever position, however, is chosen, the point of paramount importance is to have the child absolutely under control. If we fail to secure perfect immobility before the introduction of the tube, the child may, at a critical moment, through some

slight movement of the body or head, defeat our efforts at a successful intubation. For this reason the child should first of all be prepared by snugly wrapping it in a sheet, the arms being pinned down to the side of the body. The nurse is now instructed to hold the legs and trunk, while an assistant controls the head and keeps the mouth-gag in place. A table, covered with several thicknesses of blankets, over which a sheet is spread, should be used in preference to a couch or bed. Having been thus secured, he is laid upon the table, and the mouth-gag inserted into the left side of the mouth, well back between the molar teeth. The proper tube having been selected, according to the age of the child, and threaded with a loop of heavy linen thread, it is now slipped firmly over the obturator of the introducing instrument.

FIG. 2.

A word as to the size of the tube. If any doubt should exist as to which tube to choose, it is far better to favor the larger tube than a smaller size. The advantages of using as large a tube as possible are the following: There is less likelihood of the tube being coughed up, and the chances of affording relief are greater, especially when the membrane extends well down into the larynx.

The introducing instrument is now lightly held in the right hand, the operator taking a position at the patient's right, and the index finger of the left hand is passed quickly into the child's pharynx, keeping to the right side of the mouth, as shown in the illustration (Fig. 2). With the finger first feeling for the arytenoid cartilage, which serves for a landmark, the epiglottis is hooked up and held out of the way so that the tube may be guided along the median line and over the base of the tongue. The handle of the introducer is now raised, and the tube directed downward and

slightly forward into the chink of the glottis. Perhaps the most important step in the operation is to elevate the handle of the instrument at the moment the tube reaches the glottis, in order to favor its descent into the larynx. If this precaution is not carried out the tube will pass directly into the œsophagus. When the tube has entered the glottis it should be released by means of the slide on the introducer, which is pushed forward with the thumb, and then buried to its full length into the larynx by a gentle push with the left index finger upon the collar of the tube. Force is unnecessary, and, indeed, this is one thing to be especially avoided, for it is by undue pressure or rough manipulation in the larynx that the unfavorable after-effects of intubation are largely responsible. Should the first attempts fail, the finger should be removed from the pharynx, together with the tube, and the child allowed to breathe for a few seconds before repeating the attempt. The commonest mistake made is to place the tube in the œsophagus, instead of getting it into the larynx. As has been said before, this is usually due to an improper direction of the tube by failing to elevate the handle of the instrument sufficiently at the proper moment. Some operators place the index finger of the left hand directly behind the larynx, and, by passing the tube along the pulp of the finger, they find it more convenient to guide into the chink of the glottis than when the tip of the finger is placed laterally upon the arytenoid cartilages. One of the advantages of using the arytenoid, however, as a landmark is the fact that in cases associated with considerable swelling and œdema of the tissues about the larynx the cartilages can always be made out, and if we accustom ourselves to work from this point we will not be likely to become confused, no matter how much the structures of the throat may be distorted by inflammatory action. Another important point to be borne in mind is the necessity of hooking up the epiglottis with the left index finger, and getting it out of the way before attempting to introduce the tube. The epiglottis acts as a lid or covering to the larynx, and its function is to prevent the entrance of any foreign body. During deglutition it is drawn firmly over the glottis, in this way securely closing the opening into the larynx. If we do not raise the epiglottis away from the larynx and hold it there, it stands to reason that it will act as a barrier to the introduction of the tube. When well hooked up, and firmly held in this position, it can in no way interfere with the operation.

If we have been successful in our attempt a remarkable change soon passes over the child. First of all, there will occur a coughing spell more or less severe, accompanied by a characteristic whistling sound which tells us that the tube is in the larynx. The cough results from the mechanical irritation of the larynx, but this is beneficial, as it effects the removal of a large amount of tenacious mucus. The breathing, which was rapid and labored, now becomes slow and tranquil, and the normal color is restored

to the features. Usually the child passes off into a sound, refreshing sleep. As soon as we have convinced ourselves that the tube is in place and the dyspnœa relieved, we should cut the thread that has been attached to the tube. The main purpose of this thread is to make it possible for us to promptly withdraw the tube in case it has passed into the œsophagus. The method of withdrawing the same is as follows: The knot is cut through with scissors, and, with the index finger of the left hand firmly held against the collar of the tube in order to avoid an accidental extubation, traction is made upon the thread until it is entirely withdrawn.

**Extubation.**—In cases with a moderate amount of membrane in which antitoxin has been used early and in sufficient dosage, extubation may safely be attempted on the third day. Where the membrane has been extensive, or where the use of antitoxin has been delayed, it is better to wait until the fifth or sixth day. After removing the tube, the physician should remain at least an hour with the patient, at the end of which time, if dyspnœa has not returned, it is usually safe to leave the patient for several hours. Before removing the tube from any case, however, we should always have a second tube in readiness, and the child should be kept under full control until we are certain that re-intubation will not be necessary. It is surprising how quickly suffocative symptoms will return, in many cases within a few minutes, after the removal of the tube, even where everything has been progressing well to all outward appearances. For this reason, unless we are prepared to promptly re-intubate, the child may die of suffocation more quickly after extubation than from its primary dyspnœa. The reason for this rapid obstruction, after extubation, is most likely not so much due to the membrane which may still be present as to œdema and glottic spasm resulting from the sudden relief of the mechanical pressure.

The technique of extubation is, so to speak, a reversal of intubation. The child is secured in the same manner, the mouth-gag introduced, and the index finger of the left hand placed upon the right arytenoid cartilage and the epiglottis is lifted out of the way. We now feel for the collar of the tube with the tip of the finger, and, having located it, pass the beak of the extubating instrument along the base of the tongue over the epiglottis and into the opening of the tube. The jaws of the instrument are now opened by pressing upon its blade, and by this means the tube is firmly gripped and may be easily lifted from the larynx, and quickly removed from the pharynx by the index finger. A precaution, which should always be followed before introducing the extubating instrument, is to adjust the set screw in such a manner that the jaws of the instrument will open just sufficiently, but no wider, than to firmly grasp the tube. If we allow too much play, and it should slip or fail to enter the tube, serious damage may be done to the larynx.

In the great majority of cases, in which intubation has been carefully performed, sequelæ are not encountered. The voice is usually restored in the course of a few days, and respiration soon becomes normal. Aside from these transient disturbances there is little to note. In a certain percentage of cases, however, stenosis of the larynx has resulted from atresia following pressure ulceration. In other cases the intrinsic muscles of the larynx may become paretic as a result of the pressure, and pronounced disturbances in respiration will follow, making it necessary for the child to wear the tube for an indefinite length of time. Such cases are fortunately rare, and it is not the province of this paper to dwell in particular upon their management.

Fortunately, the beneficial results following successful intubation so far overshadow its evil results that its practical utility cannot be questioned. When the membrane extends too low down to enable the intubation tube to relieve the obstruction, a violent coughing fit as a result of the irritation caused by the tube will expel both tube and membrane. Under these circumstances the outlook is favorable for a second intubation. Again, we may push the membrane down ahead of the tube, and this will induce suffocation unless the tube is promptly removed and the child given an opportunity of coughing up the membrane. In these cases, a rapid tracheotomy is often the only method by which the child's life may be saved, and as we can never foretell the occurrence of such an accident, or the possibility of the membrane being beyond the reach of the tube, we should always be prepared to perform tracheotomy. This point has been referred to above.

**Indications for Intubation.**—Some writers recommend early intubation, while others believe that no interference should be instituted until the symptoms of laryngeal stenosis have progressed to a dangerous point. Personally, we believe that while there is no necessity for early intubation, especially where antitoxin can be freely administered, nevertheless we deplore putting off the operation until the child falls into a condition of dangerous collapse. So long as the child is able to cope with the obstructions, as shown by the absence of cyanosis, carbonic acid poison, and good peripheral circulation, it is perfectly justifiable to wait and give medicinal measures full chance. Unquestionably, it is an advantage for the patient to go through the attack without mechanical interference, for if we have once inserted the tube into the larynx we can never be sure just when the child will be able to get along without it, and there is also the danger of coughing up the tube and suffocating before help can be obtained. The urgent indications for intubation are marked recession of the epigastrium and infra-clavicular regions during inspiration, cyanosis and failing pulse. When these symptoms are encountered there is no time to question the wisdom of giving immediate relief. We should remember that it is our duty not only to spare the child unnecessary suffering, but also to guard against the exhaustion that results from these undue respiratory efforts.

**Nasal Intubation.**—In young children nasal obstruction may cause almost as serious an impediment to the respiration as laryngeal obstruction. Passing a tube through the nose in such cases was first recommended by Northrop, of New York, and we have been able to corroborate the clinical value of this procedure. For relieving the nasal obstruction an old-fashioned English catheter of small calibre is worked through the nares until the pharynx is reached. It is then cut short, allowing about an inch to protrude. It may not be necessary to tube more than one side in order to give sufficient relief. A case in point has been reported by Dr. H. M. Gay, which was treated in this manner at the suggestion of one of us. (*Transactions of the Homœopathic Medical Society of Pennsylvania*, 1904.)

**Feeding and Care of Intubated Cases.**—In some cases considerable difficulty may be encountered in giving the child sufficient nourishment after the tube has been placed in the larynx. Deglutition may not only be more or less painful, but the child may be unable to control the movements of deglutition properly. As a result of this the taking of food causes pain or an attack of suffocating cough. The best method of overcoming the difficulty is to feed the child in the recumbent position, with the head somewhat lower than the body (Casselberry's position). In extreme cases it may be necessary to resort to gavage, either passing the stomach tube through the nose, or directly into the œsophagus through the mouth. As far as the local treatment of the nose and throat is concerned, the less the child is disturbed the better. Benefits which may accrue from local treatment will usually be overshadowed by the inconvenience to which they put the little sufferers.

**Tracheotomy.**—Tracheotomy is one of the emergency operations with which every general practitioner should familiarize himself, as he may be called upon to perform it at any moment. The indications for choosing tracheotomy in preference to intubation has already been referred to, and, furthermore, we have stated that tracheotomy may become necessary after an unsuccessful attempt at intubation, or as a result of one of the accidents of intubation.

Before describing the technique of the operation, it may be well to recall some of the important anatomical landmarks in the anterior region of the neck. As the incision for the operation is carried out in the median line there are no bloodvessels of note to be wounded, the carotid arteries and both the superficial and deep jugular veins lying to either side of the trachea. Occasionally the thyroidea ima, a branch of the innominate, ascends upon the trachea to reach the isthmus of the thyroid gland. However, under ordinary circumstances the only bloodvessels to be encountered in the median line are the inferior thyroid veins. From this we can see that if the thyroid gland be displaced downward during the operation, and the incision not carried too low, there should be very little hæmorrhage.

The thyroid gland consists of two lateral lobes and an isthmus connecting the same. The lateral lobe extends from the alæ of the thyroid cartilage down as far as the sixth tracheal ring. The isthmus is a narrow band, scarcely an inch in diameter in the child, and lies in front of the second, third and fourth rings of the trachea. The isthmus of the thyroid is firmly attached to the lower portion of the larynx by the pretracheal fascia, and an important step in the operation is to divide this fascia after cutting down carefully upon it, after which the isthmus of the thyroid glands may easily be pushed downward and out of the way of the tracheal incision. The operation of election is the so-called *high tracheotomy.* This is preferable in the case of children to the low operation on account of the relative shortness of the neck in early life, the less likelihood of hæmorrhage,

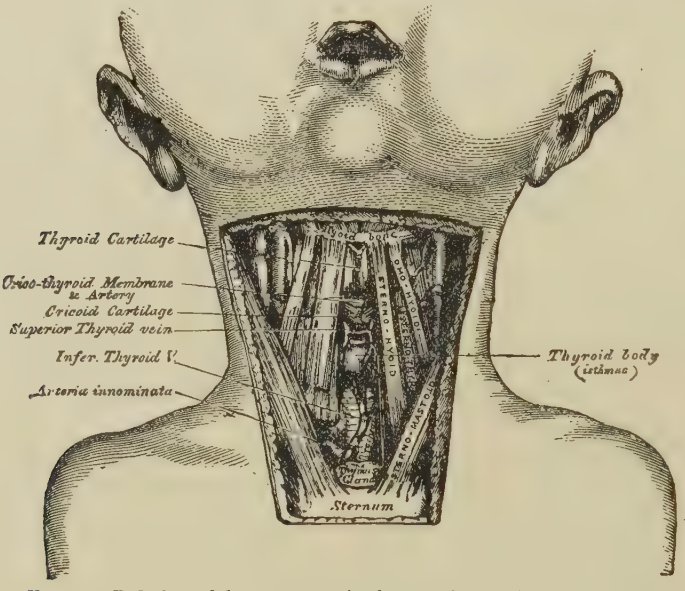


FIG. 3.—Relation of the structures in the anterior portion of the neck. (From Gray's *Anatomy.*)

and, furthermore, because of the greater degree of comfort with which the canula may be worn, and the lesser danger of the lower portion of the canula producing dangerous pressure upon the trachea. Indeed, where the tube has reached well down into the trachea, and has exerted undue pressure upon it, necrosis directly into the subclavian or innominate artery has been known to take place. As a rule, an anæsthetic will be required, although the child may be so asphyxiated that this will not only be unnecessary, but would only lead to dangerous delay. In one of our cases in which we were compelled to perform rapid tracheotomy the child was absolutely insensible to pain at any stage of the operation. Where an anæsthetic must be used, however, choloroform is preferable on account of the rapidity with which the patient can be brought under its influence, and

because of the absence of irritation to the respiratory tract which ether produces.

The position of the patient for tracheotomy should be similar to that advised for intubation, except that hyperextension of the head must be maintained in order to expose the anterior portion of the neck as fully as possible (Fig. 4). This is accomplished by placing a small pillow under the nape of the neck, or by using a bottle which has been wrapped in several thicknesses of towel. Good illumination is essential to making a success of the operation, and while great haste becomes necessary in arranging for every step of the operation, nevertheless we should not proceed too abruptly and sacrifice preparedness for speed.

The field of operation may be rapidly scrubbed with soap and water, followed by the free use of alcohol. It is needless to say that during the operation all of the usual aseptic precautions must be taken, although it is true that in spite of our best efforts more or less infection of the wound is

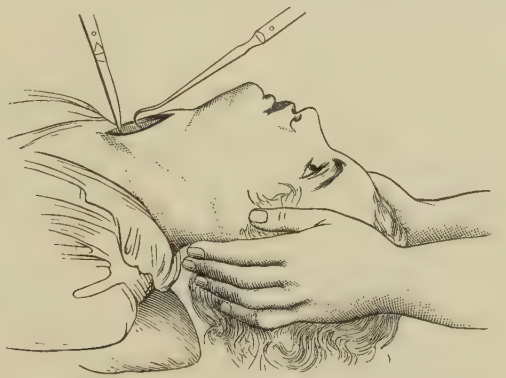

FIG. 4.—Position of patient for performing tracheotomy. (After Liston, from Wharton's *Minor Surgery*.)

to be anticipated on account of its contamination by tracheal secretions. The instruments required for tracheotomy are, first of all, a sharp scalpel, a pair of scissors, three or four artery clips, a grooved director, preferably curved, according to the suggestion of Wharton, a pair of tissue forceps, a pair of tracheal retractors, a tracheal hook with which to hold the trachea while making the incision, a pair of Trousseau's tracheal dilators, tracheal forceps for removing membrane from the trachea, needle and thread, and an assortment of tracheal tubes, preferably silver-plated. For dressings, a roll of tape, some absorbent cotton, and iodoform gauze should be on hand.

**Operation.**—The incision is made from the thyroid cartilage extending downward for a distance of an inch to an inch and a half, according to the size of the child, through the skin, subcutaneous fat, and superficial fascia until we can feel the rings of the trachea with the tip of the exploring finger. We may be certain that we are feeling the trachea as soon as we can detect the transversely placed cartilages, and note that they ascend and

descend with the respiratory act. Bleeding points should be picked up as we proceed, and it is better to use careful dissection as much as possible after the skin has once been divided. This can be accomplished either by cutting along the grooved director, or by having an assistant pick up the structures over the trachea and divide them layer by layer. Care should be exercised never to deviate from the median line. Care must also be exercised in placing the retractors, for occasionally the trachea has been seized by a retractor and thus pulled to one side, causing serious confusion to the operator. The assistant who holds the retractors must also be careful not to distort the proper relation of the parts by making undue traction.

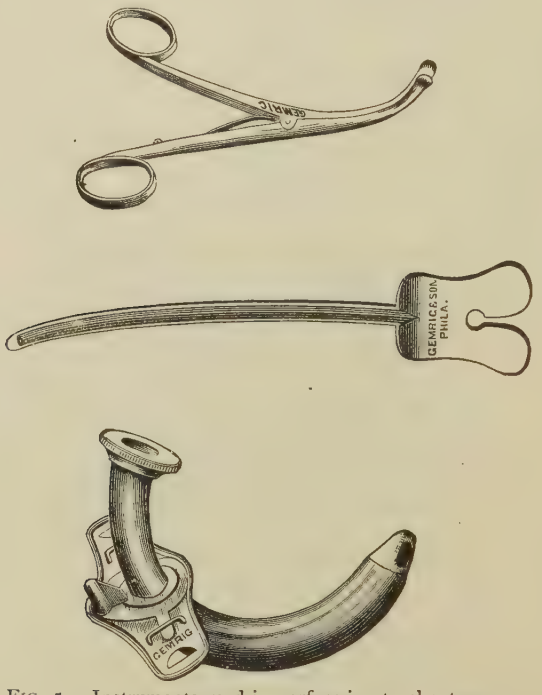


FIG. 5.—Instruments used in performing tracheotomy.
Trousseau's tracheal dilator; Wharton's curved director; tracheal canula.
(From Wharton's *Minor Surgery*.)

After we pass between the depressor muscles of the hyoid bone, which can be detected by their characteristic color, we come upon the pretracheal fascia. This descends from the thyroid cartilage and envelops the isthmus of the thyroid gland. An important step in the operation is to divide this fascia just below the thyroid cartilage by means of a transverse incision. The isthmus now becomes freely movable and may be pulled downward, thus exposing the upper rings of the trachea. The latter is now steadied by means of the tracheal hook, which is inserted below the thyroid cartilage and held with gentle upward traction. The upper three rings of the trachea are then divided by the scalpel, and in doing this we should direct

the point of the scalpel from below upward, in order to avoid injuring the vessels supplying the gland. As soon as the trachea is opened the escape of air and secretions into the wound becomes at once apparent. It is always well to delay opening the trachea until bleeding has been brought fairly well under control, for the entrance of a considerable amount of blood into the trachea may seriously interfere with the resuscitation of the patient. We now insert the blades of the tracheal dilators into the incision, and proceed to remove all loose membrane and wipe out the tenacious secretion as thoroughly as possible. As soon as we have assured ourselves that the patient is breathing comfortably we introduce the proper size tube with its contained canula, having first fastened a piece of tape to the flanges of the tube. Bleeding points are now ligated, and the cutaneous incision partially closed with one or two sutures placed below and above the tube. A dressing of iodoform gauze is placed over the opening of the tube to catch the secretions, and it is always well to pass a narrow strip of gauze beneath its flange in order to prevent as far as possible mechanical irritation of the wound.

**After-Treatment.**—In the first place, we must remember that although the asphyxia has been relieved, the patient will still require the most rigorous medical attention for the diphtheria and the local inflammation present. A skilled nurse should be in constant attendance in order that an emergency, such as clogging of the tube, or the pulling out of the tube by the child, may be averted ; and, secondly, we must remember that broncho-pneumonia occurs with alarming frequency after tracheotomy. Indeed, cases that survive the asphyxia and even the diphtheritic infection may die of septic pneumonia, unless every precaution is taken to prevent this complication.

It is very important that the temperature of the room should not be allowed to fall below 70° F., and that the air be kept moist, because it no longer obtains the modifying results of nasal respiration, but enters the lungs directly through the tracheal opening. During the first twenty-four hours the canula of the tracheotomy tube should be removed every hour, or oftener, if necessary, and thoroughly cleansed, for at this time mucus and shreds of membrane are very apt to collect in its lumen. The outer tube should never be removed except in the presence of the physician. This may be done at the end of the second day, when it should be rapidly cleaned and replaced at once, for there is danger of the wound retracting and making its replacement a matter of great difficulty. By the fourth or fifth day we should remove the inner tube and, placing our finger over the opening, observe whether the child is able to breathe through the larynx. This, of course, can only be done when we are using a fenestrated tube. If respirations take place in a normal manner we may consider the removal of the tube by the fifth or sixth day. At this time, even if the child cannot get along entirely without the tube, we may remove it for a half hour

at a time, because the wound has assumed more or less the character of a sinus, and its replacement becomes an easy matter. It is rarely necessary at the present time, if antitoxin has been freely used, to have the child wear the tube more than a week. As far as the wound is concerned, all that is necessary is to keep it carefully cleansed by changing the dressings frequently, and if closure is delayed we may hasten it by cauterizing the edges. Healing by granulation is, of course, inevitable.

## Dysentery.

Three varieties of dysentery are recognized in literature, namely, catarrhal, bacillary, and amœbic. There is every reason to believe, however, that the catarrhal cases are after all but a mild bacillary invasion ; hence, we may, for all practical purposes, place all cases under the two varieties, bacillary and amœbic.

The **prophylaxis** of dysentery demands that in localities where this disease abounds special attention must be paid to the character of the drinking water. To avoid any possibility of infection all water should be boiled, or, when financial conditions will permit, people should rely upon bottled waters from a spring of known purity. As infection may be carried by salads and raw vegetables and fruits, these likewise should be avoided. Their danger lies in contamination from infected earth and water.

The stools of dysenteric patients must be thoroughly disinfected before throwing them away. Nurses and attendants upon the sick should keep dejecta covered lest they be gotten at by flies. They should also carry out every precaution as to personal cleanliness. In other words, the prophylaxis of dysentery resolves itself into the carrying out of exactly the same measures we would enforce in typhoid fever and cholera.

Observations have demonstrated that the bacillus of dysentery may be frequently found in the stools of perfectly healthy individuals. This proves, beyond peradventure, that there must be a predisposition before the infection can take hold. The conditions which determine immunity are not known. We should, therefore, instruct patients who may be exposed to avoid eating food which is mechanically irritating, as fruits containing small seeds, vegetables rich in cellulose, unripe and spoiled fruits, and cathartics.

**Treatment.**—Rest in bed is necessary in *all* cases. This advice seems superfluous, especially as the vast majority of cases of dysentery are too ill to go about or even to sit up were they ordered to do so ; but one authority at least has advised that mild cases should be directed to keep about, because he believes that thereby they maintain strength better and pass through a more rapid convalescence. It seems inconceivable that there can be any cases who can follow this advice with advantage. Certainly, an ambulant period must, in the class of patients who are willing to accept it, afford a ready means of distributing the infecting agent far and wide. I

would even insist that the rest be as absolute as in typhoid fever. The patient should be ordered to use the bed-pan, because the mere act of getting up for stool is of itself sufficient to greatly increase the tenesmus.

**Diet.**—In the majority of cases, liquid diet only is permissible. This includes rice, barley, and albumen water, milk and its derivatives, soft-boiled eggs, farinaceous broths, beef broths, etc. While milk is invaluable in the majority of cases, it will not infrequently happen that owing to the defective digestive secretions large curds accumulate in the stomach and bowels, and these serve not only as mechanical irritants but also favor bacterial growth. When, therefore, curds are found in the stools, milk should be abandoned, or given peptonized, or in the form of koumyss, kefir, matzoon, zoolak, etc.; or it may be diluted with Vichy, or barley, or lime water.

In amœbic dysentery the diet may be more liberal than in the bacillary form. We may order small quantities of easily digested solid foods, as oysters, fish, and poultry; but we should watch their effects most carefully and regulate subsequent instructions accordingly.

**Abdominal Applications.**—All cases will find the application of a warm flannel abdominal binder grateful. It is often sufficient to give all necessary relief to the abdominal pain and rectal tenesmus. In other cases it may prove necessary to apply hot fomentations, while still others require turpentine stupes for their relief. In any case, warm or hot applications to the abdomen should be regarded as a routine part of the treatment.

**Stimulation.**—Dysentery is an exhausting disease, hence the necessity for stimulation often arises. Of stimulants, alcoholics, as whisky and brandy, are beyond all question the best. Their administration should be dependent upon such symptomatic indications as the state of the tongue, the character and frequency of the pulse, and the patient's general strength.

**Pain.**—As already stated, simple abdominal applications prove sufficient in the majority of cases. Still, there remains a large number of cases in which the tenesmus recti is practically constant, and is of itself a source of danger by reason of the loss of sleep and exhaustion it causes. In such the most reliable palliative is Morphia, which may have to be given as often as every four hours, hypodermically, in doses of one-fourth of a grain.

Enemata of starch and opium are recommended by some authorities as having a soothing effect.

**Local Treatment.**—The ordinary case of bacillary, or so-called catarrhal dysentery, will get along very well without local treatment. Those of a more severe character demand cleansing or medicated enemata. Normal saline solutions injected slowly into the colon and retained, when possible, for fifteen minutes are often curative

In amœbic dysentery there can be no question as to the value of enemata of Quinine bisulphate in the proportion of 1:5,000. Two liters

of the solution should be injected by a fountain syringe and retained, if possible, for fifteen minutes. Not more than two enemata should be given daily. With increased tolerance of the rectum, the strength of the solutions may be increased to 1:1,000 or even to 1:500.

Solutions of Cupric sulphate, 1:6,000, are said to be fully as efficacious as the Quinine solutions in destroying the amœba. They are used in the same way.

Much is said in medical literature concerning the use of Silver nitrate, Zinc sulphate, and other astringents. It impresses me that the doses advised are insufficient to exert a curative influence over the ulcerations, and that stronger doses of the same drugs are capable of doing much harm. They are, therefore, not worthy of serious consideration.

**Intestinal Antisepsis.**—The preceding paragraphs dealing with intestinal irrigations probably cover all that can be said concerning intestinal antisepsis in the treatment of dysentery. Physicians have recommended large doses of Bismuth salicylate, Salol, and other drugs of like character, but the possibility of their being efficient is very doubtful.

**Preliminary Purgation.**—The majority of old-school clinicians favor the administration of a saline purge at the outset of an attack of dysentery, providing the case is seen before the bowels have already been emptied thoroughly, and there still remain scybala in the stools. The favorite purge is Magnesium sulphate; a respectable minority prefer *Castor oil.*

The following of the purgative with *Aromatic Sulphuric Acid,* twenty minims three times daily, is universally recommended on the theory that the dysentery bacillus does not thrive in acid media.

**Internal Medication.**—*Mercurius corrosivus* leads the list of remedies for dysentery, and is now recommended by both schools of medicine. It is especially indicated by the high degree of tenesmus recti and the bloody and mucus stools. The patient complains of almost constant cutting pains in the abdomen. Pains and tenesmus continue even after stool. The straining may even extend to the bladder. Mercurius corrosivus is adapted to the worst cases of dysentery, and especially to attacks which occur in the autumn, when warm days are followed by cool nights.

*Mercurius dulcis* presents the same symptoms as those calling for Mercurius corrosivus, but in much milder degree.

*Cantharis* is indicated in cases presenting severe colicky pains. Stool is followed by cessation of the colic, but the tenesmus continues. The stools consist of watery or bloody materials, and contain pieces which resemble scrapings of the intestines. A very characteristic symptom of Cantharis is dysuria in association with the tenesmus recti.

In the early stages of an attack of dysentery, in fact before the clinical phenomena are such as to more than offer a suggestion as to the diagnosis,

*Aconite* and *Ferrum phos.* are often indicated. The Aconite case is characterized by fever, scanty loose stools, with tenesmus, chills, thirst, and restlessness. The etiological factor is cool nights following warm days.

*Ferrum phos.* is suggested by the predominance of blood in the fæcal evacuations, though mucus is also present. Pain and tenesmus are slight.

When the quantity of blood in the stools is so large as to suggest actual hæmorrhage, a condition which may occur late in the course of dysentery, *Hamamelis* is an excellent remedy. It may also be given locally in enema, of equal parts of water and the distilled extract of Hamamelis.

*Arsenicum album* is a very important remedy for cases presenting a high degree of adynamia. It is usually called for in the advanced stages of the disease, when ulceration is pronounced and the stools are notable for their foul odor. The stools contain pus in addition to blood and fæcal matter. The patient is greatly exhausted; his face is sunken and features pinched. Restlessness is extreme.

*Baptisia* is likewise indicated in cases attended by a high degree of asthenia. The tongue presents a brown coating; bloody stools and tenesmus are present, but there is a remarkable absence of pain.

*Colchicum* presents as its characteristic indication tympanitic distention of the abdomen, constant sense of constriction at the anus more prominent than the tenesmus during stool; stools contain but little fæcal matter, but much transparent gelatinous membranous-appearing mucus; great weakness; cramps in the calves of the legs.

*Arnica* and *Rhus toxicodendron*, like Arsenicum and Baptisia, are useful in cases presenting typhoid symptoms; *Arnica* being indicated by stools having a foul odor, and slimy, bloody, or even purulent in appearance; tenesmus recti prominent. Hughes recommends Arnica as the principal remedy in what we might call hæmorrhagic dysentery. *Rhus tox.* is to be prescribed more on the general features of the case, *i.e.*, its typhoid aspect, rather than upon special symptoms. Farrington, however, lays special stress upon tearing pains down the thighs during defecation. The stools, according to the same authority, consist of blood "and slime mixed with reddish yellow mucus."

*Aloes* should be prescribed in cases presenting severe pain in the hypogastrium; also in cases in which the patient complains of the sensation as if the abdomen is greatly distended, but is not; tenderness of the abdomen on pressure; stools scanty, bloody, jelly-like, or composed of a foul-smelling mucus.

*Colocynth* and *Dioscorea* are indicated in cases presenting colicky pains as their characteristic feature. Under *Colocynth*, the pain centres about the umbilicus, is griping in character, causes the patient to double up, and is relieved after stool. The stools are mucus, fæculent, and have a sour odor, but the tenesmus is a minor factor.

Under *Dioscorea*, the pains involve the abdomen, but radiate upwards into the chest and even into the extremities. Tenesmus is slight; the principal morbid sensation is a burning in the rectum. The stools present an albuminous appearance with scybala.

*Capsicum* was recommended by Farrington for dysentery occurring in moist weather, and in stout, flabby individuals, the pains and other symptoms being aggravated by slight drafts of air. The local symptoms present nothing that can be regarded as characteristic.

*Ipecacuanha* is much used by old-school physicians, many of whom regard it as a specific. On the other hand, there are some who have had an extended experience, as Strong, who look upon it as useless. With us, it is prescribed when nausea and vomiting are prominent symptoms. The tongue is moist, yellowish or white. The stools are dark, almost black, and present a fermented appearance. Woodhull, as quoted by Hare,* expresses himself as feeling that Ipecac is as truly a specific in dysentery as Quinine is in malaria. The following are his directions for its use:

"The stomach must be empty and the patient recumbent. About twenty minutes before giving the Ipecac it is well to paint the epigastrium, not the whole abdomen, with tincture of iodine, or to apply a mild sinapism sufficiently to induce gentle counter-irritation. This precaution may sometimes be omitted, or may be deferred until the medicine has been taken. Ten or 15 minims of laudanum may be given, always on an empty stomach, to be followed in 10 or 12 minutes by from 15 to 30 or more grains of Ipecac in pill form or as a paste, with a very small quantity of water. No food or fluid should be taken for at least four hours, and recumbent rest should be strictly maintained. If the Ipecac is administered in pill or capsule, the laudanum may be mixed with it instead of given previously. One scruple of Ipecac and one grain of Opium can be made into four pills, or the laudanum can be put in the pills. When pills are used, they should be freshly made. Or 20 grains of Ipecac can be suspended in two fluid drachms of water with a few drops of aromatic to disguise the taste. It is never advisable, on account of the popular idea associated with it, to disclose the name of the medicine, and the patient should be warned to resist any inclination to vomit. The size of the dose should be in proportion to the gravity of the case. Just as in severe colic very large doses of Opium are tolerated, and in pernicious fever enormous quantities of Quinine are indicated, so in dysentery surprisingly large doses of Ipecac are well-borne, although the magnitude of the dose should bear some relation to the severity of the disease. With a little experience that relation can soon be determined. Sixty grains is not a maximum dose for an adult, but with ordinary acute dysentery from 15 to 25 grains at a time should suffice. If the first or any subsequent dose is rejected, which rarely happens if these

* *Practice of Medicine*, 2d edition.

rules are carefully followed, it is to be repeated after a short interval. The retching or vomiting of exhaustion or the restlessness of delirium is no bar, but rather an inducement, to this treatment; and small children or delicate women can take it with impunity in proportionate amounts.

"The common course in acute dysentery is, first, the relief of pain, next, the subsidence of the fever, and then the cessation of the bloody discharges. The usual sign that recovery is at hand is a painless, copious, semi-fluid evacuation, much the color of ipecacuanha powder, not black as has been stated. The medicine may then be reduced or entirely suspended. In acute cases these results will follow very quickly. In chronic dysentery, complete recovery may be delayed, or, indeed, may fail of absolute attainment, but great amelioration may be confidently anticipated. That the powder should be pure and comparatively fresh is always essential."

In hæmorrhagic dysentery we may prescribe *Capsella bursa pastoris*, *Erigeron*, *Millefolium*, *Turpentine*, and *Hamamelis*.

Additional remedies to be studied as having a therapeutic relationship to dysentery are *Podophyllum*, *Euonymin*, *Nitric acid*, *Nux vomica*, *Magnesium sulph.*, *Rhubarb*, *Chamomilla*, *Cocculus*, *Apis*, *Cannabis sativa*, *Cuprum metallicum*, *Cuprum arsenicosum*, *Veratrum album*, *Camphor*, and *Agaricus*.

The exhausting character of the disease makes convalescence slow, especially so in view of the disabled condition of the alimentary tract. It is of the highest importance, while pushing nutrition to the utmost, that such foods should be selected as can be best tolerated by the stomach and bowels.

## The Malarial Fevers.

**Prophylactic.**—With the present advanced knowledge of the etiology of malarial fevers, we should be able with proper precautions to make these widespread fevers a thing of the past. In the first place, we know beyond any contradiction that malaria is due to infection by an intermediate host, a particular variety of the mosquito, known as the Anopheles. This fact, then, tells us that we must make every effort to destroy mosquitoes in localities where malaria exists, just as the authorities have destroyed the mosquito in Havana. The plan pursued by Major Gorgas (*vide* article on Yellow Fever, p. 38), *i. e.*, the use of coal oil on stagnant pools, is as applicable to malaria prevention as to that of the dread disease of the American tropics.

In cases of reservoirs for storing water for domestic purposes, the use of coal oil is impracticable. The only means we have for killing mosquitoes which breed in them is by stocking them with fish.

In certain portions of the country there are large areas of marsh or low-lying land. These offer favorite breeding-places for mosquitoes, and the surrounding districts have long been notorious for malarial infection. The drainage or filling in of these areas at once does away with the mos-

quito. Unfortunately, the reclaiming of marsh land is regarded as an industrial or mercantile proposition and not a hygienic one. Hence, such large ventures will be undertaken only when a business profit will result therefrom. Small pools which can be filled up with a few cart-loads of loam is a matter of private precaution, which the physician should advise his patients to adopt for their own account.

As in the case of yellow fever, it is necessary for a mosquito to bite a patient who has malarial fever before it is capable of transmitting the infection. The natural corollary of this proposition is the thorough isolation of the malarial fever patient, and his protection while in bed by mosquito-netting.

Again, it should be the duty of those residing in malarious districts to protect themselves from infection by having the windows and doors of their houses properly protected with netting, and at night, giving themselves the additional safeguard of mosquito-netting over their beds.

The above-described simple safeguards against malaria are too commonly respected in their breach than in their observance. The remarkable efficiency of Quinine as a preventive and cure of malaria has led too many patients and physicians to neglect other precautions. While it is true that the daily administration of five grains of Quinine sulphate will act as an almost certain preventive, there is no one who will contend that such regular taking of the drug does the human organism any good, and many will assert that it does positive harm. It is our duty to insist that our malarial fever patients be as carefully guarded for the protection of others as they would were the disease one of the other acute infections.

**Treatment.**—The remarkable efficiency of Quinine in the treatment of malaria has led to neglect of proper hygienic measures in patients suffering from that disease. Indeed, it is the common rule for such patients to be up and about their daily duties excepting when the paroxysms have so disabled them that they must take to their beds. Although we have a specific for malaria, we should remember that the disease, like other infections, has its sequelæ and complications, which include disturbances of the nervous system, pneumonia, bronchitis, endocarditis, functional disturbances of the heart, nephritis, dysentery, enteritis, etc. The patient should, therefore, be confined to his bed and at rest until the period for a paroxysm has passed. During the febrile stage the diet should be very sparing. Usually the patient calls for nothing, and inasmuch as the fever is of short duration and not exhausting, he may well be let alone. During the interparoxysmal period he should be given nutritious, easily digested standard foods, as milk, eggs, and the lighter meats and vegetables. Patients with æstivo-autumnal infection require to be fed on light but highly nutritious food, as with them the disease is of long duration and the fever correspondingly exhausting. We should therefore insist upon feeding at short intervals, the articles

selected being milk, eggs, custards, broths, and soups. When the temperature has remained normal for twenty-four hours, the diet should be made more generous, because these cases are always more or less anæmic and exhausted.

The efficient remedy for practically all cases of malaria is Quinine, which should be administered in the form of the sulphate or the muriate. There are physicians who contend that Quinine is not a specific in malaria, but their conclusion is based upon improper premises. If they would but investigate their cases thoroughly they would be forced to agree with the majority of the profession that the failure of a supposed malarial fever to yield to Quinine proves that the diagnosis was not correct. Bad results are almost always due to improper methods or inefficient medication.

While the derivatives of Cinchona have been used in the treatment of malaria for over 250 years, the methods of administration of the drug have been changed from time to time as dictated by additional experience. My largest experience in the treatment of malaria was gained a number of years ago in an especially malarious district of New Jersey. It was my custom at that time to prescribe Cinchonidia sulphate, owing to its much less cost than Quinine. Very prompt results were secured by giving five grains every three hours. It was the general custom at that time to give the latter drug at relatively short intervals, and over quite a period of time. Undoubtedly this system led to the taking of much larger quantities of the drug in the aggregate than were necessary. Since then the tendency has been to determine by laboratory research and clinical experience the time at which the Quinine can be administered with maximum therapeutic effect, until now the best clinicians are favoring the exhibition of single large doses of the drug at a time when the destructive effect on the parasite will be the greatest. The idea is to bring it in contact with the plasmodia when they are young. With this idea a single large dose is administered with the decline of the fever or immediately after the cessation of the paroxysm. This almost invariably prevents the succeeding attack. In double quartan or tertian infections we cannot be certain in putting an end to the disease thus promptly; hence, if there is a recurrence, the dose (15 to 20 grains) should be repeated. To guard against a recurrence of the attacks it is well to administer five grains of Quinine daily for another week.

Much has been said of the difficulty of subduing æstivo-autumnal fevers with Quinine. In this matter current errors have been due to mistaken diagnoses or improper methods of administering the drug. Assuming that the case is certainly one of malarial infection of the æstivo-autumnal type, we should gain complete control of it by the administration of five to ten grains of Quinine every four to six hours.

When the malarial fever is of the pernicious type, the quinine must be administered hypodermatically. We must here use the hydrochlorate or

muriate, dissolved in two parts of water, immediately before administration. It is of the highest importance that every antiseptic precaution be adopted in giving the injections. The syringe should be sterilized. The skin at the site of injection should be scrubbed with a 1:1,000 bichloride solution. The injection should be made deeply into the muscles, preferably those in the gluteal region. The hypodermatic treatment is not to be used by preference, but because of necessity. The injections are always more or less painful. Indurations are common. Abscesses may form if antisepsis has been at all lax.

The only real contra-indication to the administration of Quinine is idiosyncrasy. Much of the talk against the drug is the product of active imaginations or improper dosage and administration. Even the cases of idiosyncrasy are exaggerated; but we occasionally observe cases in which the phenomena resulting from even infinitesimal doses of the drug border on the realms of fiction. I myself have seen one such remarkable case. The use of a tooth-wash colored with tincture of cinchona, the application of a Peruvian bark hair tonic, the presence in a room where Quinine was being handled were all sufficient to send the patient to bed with a series of phenomena that I would not have credited had I not seen them.

For patients who have this idiosyncrasy developed to such an extent as to prevent the administration of quinine the best remedy is Methylene blue, in doses of two grains three times daily. It cannot be administered in this way for more than a couple of days because of the production of an intense strangury, and some claim an albuminuria.

Experience shows that there are cases of malarial fever which do well on much smaller doses of Quinine than above advocated. If the physician so chooses he may experiment with them; but, at the same time, he should understand that the surest results will be obtained if he follows the advice given in these pages.

The conditions which are liable to be mistaken for malaria, and because of which Quinine has obtained the reputation of failing, include typhoid fever, pulmonary tuberculosis, nerve prostration, pus formation, septic infections, disease of the gall-bladder, and latent pneumonia. Over these Quinine is powerless. The fact that such conditions have persisted despite the administration of the drug has led the short-sighted to infer that they were the result of the drug administration.

The convalescent malarial patient requires attention, as does any other recovering from an exhausting systemic infection. To this end, he should rest from his work for a short time, take plenty of good food, and, whenever finances will permit, make a change of climate to the mountains or seashore.

Of the remedies for this stage, Arsenicum album, Arsenic iod., and Chininum arsenicosum are unquestionably the most reliable.

Special symptoms during the course of the disease may call for Aconite, Ipecac, Veratrum viride, Gelsemium, Ferrum phos., Camphor, or Phosphorus.

For the benefit of those who have had failures with Quinine, the following therapeutic suggestions are presented:

*Cinchona.*—This remedy is adapted to either the tertian or quartan type of cases. Thirstlessness characterizes the stages of chill and heat, though it may be present both before and immediately after the chill. The chilliness causes the patient to wrap up warmly, though he obtains no relief therefrom. The fever is long-lasting, with desire to uncover; the face is bright red, and the patient is often delirious. The sweat is profuse and exhausting. During the apyrexia the face is sallow, the spleen enlarged; aching soreness in the left hypochondrium; œdema of the feet; sleep disturbed, especially by visions of figures, etc. Cinchona is practically never the remedy for persistent cases.

*Arsenicum* is, next to Quinine, our most useful remedy in the treatment of intermittent fever. It is invaluable in combating the cachectic condition which follows cases which have persisted because of inefficient treatment in their earlier stages. The Arsenicum case does not present the clearly-defined stages of the disease. The chill is usually slight or irregular, but the fever is severe and prolonged and is attended by great thirst, especially for hot drinks. The sweat is slow in appearing, and is not always attended by relief of symptoms. The interparoxysmal stage is characterized by many symptoms of cachexia, as œdema, enlarged spleen, and liver; neuralgia of one side of the face; nausea and vomiting, and tinnitus aurium.

*Eupatorium Perfoliatum.*—The characteristic symptoms of this remedy are the severe pains and the vomiting as the chill passes off. The case is evidently one of double infection, as shown by the appearance of the chill in the morning of one day and the afternoon of the next. It is often preceded by thirst and vomiting of bitter materials. Bayes regards pressure and weight over the forehead a most positive indication for Eupatorium. The aching continues during the febrile stage. The sweat is either slight or absent.

*Ipecacuanha* has been recommended by our earlier practitioners for cases which have been spoiled by Quinine. Perhaps it would be better to say for cases in which Quinine has not been properly used. The symptoms are poorly defined, so that the physician can get no indications for any special remedy. The chill is short and the fever long. Gastric symptoms are prominent and include nausea, vomiting, diarrhœa, anorexia, etc. Thirst is absent. The apyrexia is usually characterized by the gastric symptoms mentioned above.

*Capsicum.*—The chill, which is a prominent feature of the case, begins in the back and is attended by thirst. The patient experiences great relief from general or local applications of heat.

*Menyanthes* is also useful in cases in which the chill is a prominent feature. The icy coldness extends even to the tips of the fingers; thirst is absent.

*Canchalagua* has been recommended for cases recurring in the spring.

*Eucalyptus* enjoys considerable reputation in the treatment of malarial fevers, but special indications for it have never been formulated.

*Nux vomica* is useful in cases in which the chill is a prominent feature, and is attended by blueness of the finger nails and preceded by aching of the body, gaping, and yawning. The interparoxysmal period is characterized by dull frontal headache, vertigo, nausea, and other gastric symptoms.

*Cedron* is the remedy for the periodical neuralgias, especially in the supraorbital region—brow-ague—which are so frequently of malarial origin.

*Alstonia scholaris* is a remedy which has not been extensively used clinically. It is indicated, however, in chills and fever with diarrhœa.

*Aranea diadema* is useful more for the malarial cachexia than the characteristic intermittent fever. The symptoms are poorly defined, including dyspeptic manifestations, general aching, and an indefinite type of fever, but with this added characteristic—a remarkable tendency to aggravation at every cold or damp change in the weather.

*Cornus florida* is indicated in cases in which the chill is preceded for a considerable interval by sleepiness; the patient though chilly is warm to the touch; the heat, like the cold stage, is associated with drowsiness and is followed by profuse sweat.

*Gelsemium* is to be used in cases in which the chill runs up the back or starts in the feet and travels upwards. The patient suffers from a general bruised feeling all over the body, and experiences relief if he is held during the chill to prevent his shaking. Noise and light are intolerable. The heat is attended by red face. The sweat is slight or partial but relieves all pain. White or yellow coating of the tongue; thick speech; bowels constipated; stools yellow. Drowsiness, vertigo and mental dulness.

## Blackwater Fever.

(***Hæmoglobinuric fever.***)

There are two important factors in the etiology of blackwater fever which should have a bearing on its treatment, namely, its relationship to both malaria and the administration of Quinine. There can be no question concerning the occurrence of the disease in localities where *severe* malaria is common; also, that it never occurs excepting in persons who have already given ample evidence of malarial infections; and again, there is ample evidence to suggest that in some way it bears some relationship to quinine which, instead of effecting a cure, commonly aggravates the disease, if it does not actually produce it.

To make the factors at our disposal still more contradictory, residents

of malarial districts who take prophylactic doses of quinine, and therefore never have malaria, do not contract blackwater fever.

We have to admit then a malarial infection which puts the blood in such a condition as to make it possible for Quinine to produce a hæmolysis. Neither etiological factor alone is a sufficient cause.

By way of treatment, Quinine is inadmissible, though some have suggested it may be used hypodermically in small doses. *Methylene blue*, which has proven a satisfactory remedy for malarial fevers, may be tried.

The pathological changes suggest a line of remedies intimately connected with hæmolysis, as *Arsenic*, *Phosphorus*, *Lachesis*, *Crotalus*, and other snake poisons.

Dr. Hayward * recommends beginning the treatment with *Ipecac* when there is nausea, and the urine is reddish or brownish. If the urine be blackish, then *Phosphorus*, particularly with the characteristic blackish or coffee color with insatiable thirst. But if the blood appears as if dissolved in the urine and vomit as though the red corpuscles were broken down, then *Crotalus* is the remedy. If the temperature be elevated, alternate with *Aconite* until it falls.

The general management of the disease will be suggested by the general condition of the patient and his symptoms. Especially do we have to combat the anæmia and the uræmia.

## Erysipelas.

**Prophylactic.**—Isolation of the patient should be practiced whenever possible, although the danger of communicating erysipelas to healthy individuals is slight, unless there is gross carelessness on the part of attendants and relatives. It must be remembered that the infection can be carried only by direct contact. Especial care should be observed respecting the disposal of soiled dressings and the thorough disinfection of the patient's linen and bed-clothing. Articles of little or no value are better disposed of by burning.

The physician in attendance upon a case of erysipelas should observe care lest he carry infection to his patients, operative and otherwise. He should, therefore, make it a rule to wear rubber gloves while examining the seat of disease, and should protect his clothing from accidental infection by discharges by wearing an operating gown. These articles of wearing apparel may be left at the patient's house, and at the termination of the illness should be efficiently disinfected under steam pressure, or by strong bichloride solution, before being used again. Should all these proper precautions be observed there is no danger whatever of communicating the disease, even to those supposed to be most liable to take it. In view, however, of the possibility of neglecting some small detail, it is the wisest plan

* *Revue Homœopathique Francaise*, Nos. 7, 8, and 9, 1898.

for the physician to leave the erysipelas case to the last of his rounds. It is obvious that resident physicians, nurses, and those who have any duties in connection with the patient should be entirely excluded from other services, unless the hospital organization is such as to make their attendance necessary. In that case they must surround themselves with a perfect personal antiseptic technique. Puerperal patients are peculiarly susceptible to infection. Hence, a physician should refuse to attend them when he has charge of one or more cases of erysipelas. Still, it must be borne in mind that there need be no danger if a perfect antiseptic technique as to the toilet of the physician be carried out. Protection of one's clientele demands excessive precautions.

When erysipelas develops in a hospital the patient must be isolated. Notwithstanding the supposedly perfect antiseptic organization in such institutions accidents can happen, especially because of the numerous individuals who may be associated in charge of the case, carelessness on the part of any one of whom may bring disaster.

There is a class of individuals who have attacks of so-called idiopathic erysipelas from time to time. Investigation has shown that such cases are not really idiopathic in origin, but originate in infection by way of a small lesion of the nasal cavities. One case in which the infection took place through an eczematous external auditory meatus has been reported. The lesson to be derived from these cases is obvious. Small ulcerations of the parts about the face and head are never too insignificant to demand serious attention, for they are the most common cause of erysipelas in this part of the body.

**Treatment.**—The measures designed for the treatment of erysipelas resolve themselves into the local and constitutional. As to their relative value it is difficult to speak, because uncomplicated erysipelas presents a low mortality. It is only dangerous in the aged, the alcoholic, and nephritic. Many measures have therefore secured a high reputation which is entirely undeserved. Still, we are able to advise with considerable degree of wisdom in view of our present exact knowledge respecting the etiology of the disease and the methods by which it spreads.

**Local Treatment.**—Here antiseptic applications now enjoy a high reputation. Prominent among these is the application of mercuric chloride, 1:1,000, or the spraying of the affected parts with the same strength solution in ether.

The plan of treatment that has met with most favor is one designed to wall off the inflammation from healthy tissue. The measures proposed to effect this end are simple and efficient. When the disease involves the face, a "fence" of iodine should be painted around the lesion and over *certainly healthy* tissue. In case of involvement of some other portion of the body, the "fence" should be painted with pure carbolic acid. For a

general dressing almost any protective is efficient. Those which are more commonly in use include carbolized oil, carbolized vaselin, mercuric chloride, 1:1,000, and alcohol.

The painting of the affected parts with iodine, nitrate of silver, and some other substance is entirely unnecessary. When the appearance of the parts suggest the possibility of the tissue becoming gangrenous their use is positively dangerous.

Blodgett* recommends, instead of the iodine or the carbolic acid "fence," the surrounding of the inflammation with a ring of contractile collodion. The lesion, he declares, very rarely crosses the line thus formed. The collodion treatment should never be employed on the scalp, where it becomes entangled with the hair and is difficult of removal; nor should it be applied about the eyelids, for in one case it produced a panophthalmitis.

Kraske and Riedel† have proposed fencing in the erysipelas by a series of cross incisions, which they have compared to a rail-fence. These incisions should be made entirely within the healthy parts, and should not extend deeper than the skin. If the wounds should be subsequently invaded by the infectious inflammation, it is evident that they have not been made entirely outside of the diseased area, and a new series of incisions should be made promptly. The subsequent treatment of the case includes the application of bichloride dressings.

As soon as there is evidence that the erysipelas assumes the phlegmonous type free incisions to secure thorough drainage should be performed. There need be no fear of being too radical in doing this; free drainage must be established, no matter how many incisions may be required to secure this result.

Hueter recommended many years ago the hypodermic injection of a 3 per cent. solution of Carbolic acid around the inflamed area. While this form of treatment has given good results, it is being abandoned for the simpler measure—the protective "fence."

The antitoxin treatment of erysipelas has not met with much favor, Killiani‡ being the only prominent authority who views it with enthusiasm. The majority look upon it as useless.

The red-light treatment, as advocated by Finsen, is improperly named. Whatever results are secured by it are due to the exclusion of the chemical rays. The red light *per se* is not active for good. Inasmuch as the ordinary surgical dressings are light-proof, it is difficult to see how subjecting the patient to the annoyance of exposure to red light has any special advantage. In many cases it is so annoying as to be a positive detriment.

As the prognosis of erysipelas is unfavorable only in persons who are

* *Reference Handbook of the Medical Sciences*, vol. iv, p. 6.

† *Twentieth Century Practice of Medicine*, vol. xvi, p. 428.

‡ *Twentieth Century Practice of Medicine*, vol. xvi, p. 430.

in bad general health, as in the alcoholic, the aged, and the nephritic, we are warned to look carefully into the patient's constitutional condition and maintain it at as high a standard as possible. No matter how mild may be the attack, the patient must be kept in bed. His strength must be preserved by the administration of highly-nourishing liquid foods. Elimination should be encouraged by the free drinking of pure water. Cool sponging or bathing of the surface of the body is useful, not only for cleanliness but also for the reduction of fever.

The remedies most frequently indicated in ordinary cases of erysipelas are *Belladonna*, *Cantharis*, *Rhus tox.*, *Apis mellifica*, and *Graphites*. Of these, *Belladonna* is probably indicated by the existing conditions more frequently than any of the others. It is especially adapted to the smooth form, when the inflamed area presents a bright-red color. Fever is intense, and the pain is attended by well-defined throbbing. The head is hot and the extremities cool or cold. Belladonna still remains the remedy though delirium supervenes, or the erysipelas is associated with manifestations of meningitis. *Stramonium* is another remedy in the cases attended by cerebral symptoms; though with the latter remedy the disease assumes the adynamic type, and the delirium is associated with considerable restlessness and crying out.

*Atropia* 3 was recommended by Kafka in cases in which Belladonna, though apparently indicated, did not act satisfactorily.

*Apis mellifica* has as its chief indication an associated œdema. The inflamed area presents a pinkish, rosy hue; occasionally it may happen to be purplish. The pains are of a burning, sticking or pricking character. Both it and Belladonna are adapted to phlegmonous erysipelas.

*Rhus tox.* is one of the remedies for the vesicular variety. The diseased area is covered with large blisters. The pains are stinging and burning. The affected parts present a dusky red. With these local phenomena there are not infrequently associated in the Rhus case the numerous symptoms which go to make up the general condition known as the typhoid state.

*Graphites* is often prescribed empirically in erysipelas. It is indicated more especially by the character of the discharge which may happen to be present, namely, gummy.

Goodno regards this remedy as decidedly the most satisfactory in its results. Dewey* would limit its use to "the repeated and chronic form recurring about the nose and face," and in those patients in whom attacks are brought on by slight causes. "The slightest irritation to the skin brings on an attack."

*Arsenicum album* is the principal remedy for the adynamic or asthenic cases, especially when occurring in nephritic or alcoholic subjects. It is

* *Practical Homœpathic Therapeutics*, p. 113.

indicated mainly by the constitutional symptoms, especially by restlessness and prostration. It is one of our main remedies for gangrenous erysipelas.

*Veratrum viride* is recommended by Dewey* as "a fine remedy in the first stage of phlegmonous erysipelas for the intense inflammation."

*Hepar sulphur, Mercurius*, are indicated when suppuration supervenes. These remedies are also adapted to the gangrenous cases. In the latter connection, we may study also *Arsenicum, Lachesis, Carbo veg.*, and *Secale.*

*Arnica* is useful in phlegmonous erysipelas with tenderness and pain on pressure and lameness.

*Sulphur* will be found to be the most satisfactory remedy for protracted migrating cases of the disease.

*Euphorbium* is indicated in cases characterized by the formation of large yellow vesicles with violent fever and attended by boring or digging pains. The lesions affects by preference the head and face.

## Septicæmia and Pyæmia.

The treatment of septicæmia and pyæmia is really a surgical problem, the medical man's interest in the subject being confined mainly to abscesses of internal viscera, secondary lesions in the course of numerous diseases, and the terminal infections. These diseases being the result of germ infections—and generally mixed—and, as a rule, incurable, in case of an inability to get rid of or control the primary suppurative focus, the treatment is essentially prophylactic. This means that as soon as a lesion subject to surgical relief is diagnosed the proper operative measures must be instituted promptly, and this under the most rigid antiseptic precautions. The technique involved is essentially a surgical problem, and need not be reviewed at this time and place. It is merely sufficient to say that strict attention to details is a prerequisite to success. Among the visceral lesions capable of giving rise to septicæmia and pyæmia are pyelitis, pyelonephritis, cystitis, gastric ulcer, the various sequelæ of cholelithiasis, appendicitis and many others. Reference may be made here to bed-sores attendant upon myelitis and typhoid fever, the treatment of which must be carried out with strict attention to antisepsis and asepsis. The application of poultices, prepared no matter how beautifully from a pharmaceutical standpoint, is to be mentioned to be severely condemned.

Septicæmia or pyæmia having been diagnosed, the first desideratum is the discovery of the infecting focus. This should be opened thoroughly and free drainage established. The diseased parts must be cleansed thoroughly with standard antiseptic lotions, notably mercuric chloride in solution of 1:1,000 to 1:5,000, according to the part of the body which happens to be diseased. In cases of pyæmia, the causal treatment is even more unsatisfactory than it is in septicæmia because of the multiplicity of

* *Ibid.*, p. 112.

the suppurative foci. Nevertheless, these should be thoroughly opened and drained, as far as it is possible to accomplish the result without aggravating the patient's condition.

All Cases of Septic Infection are Best Treated before They Develop: by which statement we mean to convey the idea that lesions which may possibly become suppurative or septic should be treated surgically at the earliest possible moment.

Septicæmia having once developed, it is very difficult to say how much can be done in the way of successful or curative treatment. Of course, our efforts to remove the cause should be made; but we cannot hold out the promise of success which could have been given earlier in the case. We are now obliged to treat the case on a symptomatic basis. Some claims have been made for the efficiency of certain lines of treatment directed to the intoxication *per se*. Of these, the antistreptococcic injections offer the most hope. There can be no doubt concerning the value of this remedy in cases of pure streptococcic infection. Unfortunately, a very large majority of the cases of septic infection are dependent upon multiplicity of bacteria. The antistreptococcic serum cannot, of course, protect the system against the ravages of these. It does, however, benefit to the extent of antagonizing the streptococcic infection as far as it may exist. Over infection from the associated bacteria it has not the slightest influence. To be successful it must be given in large doses, and repeatedly. So far as is known, it is incapable of producing any bad effects.

Another plan of treatment is the one advocated by Crede, the use of colloidal silver, known in the trade as *Collargol*. Opinions differ as to its value, the majority of clinicians failing to see any benefit as the result of its use. It has been used by inunction and hypodermically. Serious results have followed the latter method of administration. The inunction treatment is harmless. The ointment used is of 15 per cent. strength. Two or three grammes of the ointment are well rubbed in at a seance.

Maguire's intravenous injection of 50 cc. of a 1:800 solution of *Formalin* is another line of treatment proposed. With this quantity injected the blood should contain formaldehyd in the proportion of 1 to 200,000. This plan of treatment has not come into general use, though the few who have tried it have had some little success with its application. Instead of making the solution of Formalin in plain water it has been proposed to use normal salt solution as the diluent.

Washing the blood by repeated intravenous infusions or hypodermoclyses of normal salt solution is a rational procedure. It has succeeded in aiding in the cure of many cases, but must not be regarded as a specific. It is simply one of the measures which should be regularly employed in generalized septic infection. As much as one quart to three pints may be given daily in this way.

The general management of the patient is based upon about the same conditions as prevail in adynamic fevers generally. The patient's condition is such, as a rule, as to make liquid food only admissible. Owing to the exhausting character of the illness this must be as highly nourishing as it can be made. Hence, the patient should be given milk, rich broths, raw eggs, and whisky or brandy. The latter are especially valuable, and may be administered in large quantities, for the septic patient exhibits a remarkable degree of tolerance to them. As the case improves the diet should be extended so as to maintain nutrition at a maximum. Good ventilation is an important adjuvant in the treatment.

While the main object throughout the conduct of the case is the combating of the toxæmia, the condition of the circulation, and especially of the heart, must be observed, and treatment directed accordingly. With the first signs of a failing circulation, cardiac stimulants must be administered, and of these none is better than alcohol. The latter not succeeding, we may resort to certain drugs. Here comes in a very important point. In practically all cases of septicæmia the intravascular pressure is low. Hence, medicines which reduce arterial tension, as Glonoin and Nitrite of Amyl, should practically never be prescribed. On the contrary, we should make our selection from such drugs as *Adrenalin*, *Suprarenal extract*, *Strychnia*, *Atropia*, and *Digitalis*. In each case we should determine whether the circulatory failure is dependent upon the heart *per se* or upon the general arterio-capillary condition. In the former case, we should administer the cardiac tonics ; in the latter, the vaso-constrictors.

Treatment directed to the fever specifically is not likely to be of much advantage. Antipyretic drugs certainly keep the temperature at a moderately low level. Very few are now willing to admit that their exhibition results in any permanent or real benefit. If antipyretic measures are deemed advisable, they should include the different measures laid down in the chapter on Hydrotherapy.

Notwithstanding the frequency of septic infection, and the large experience which physicians must have had with it, homœopathic literature is remarkably silent respecting the remedial treatment of the disease. Lilienthal, whose work is generally regarded as almost an encyclopædic text-book on therapeutics, is notable for his silence on the subject. All the information he imparts is conveyed in two lines in a total of 1144 pages of text, and these consist of mere mention of 15 remedies, as follows : *Apis*, *Arsenicum*, *Belladonna*, *Bryonia*, *Carbo veg.*, *China*, *Crotalus*, *Lachesis*, *Phosphorus*, *Rhus*, *Secale*, *Silicea*, *Sulphur*, *Veratrum album*, and *Veratrum viride*. Jousset entirely ignores the subject. Goodno says a few words respecting the prophylactic and surgical treatment, and mentions a list of remedies. Those who do enter into the subject seem to speak from a theoretical standpoint only.

Of the remedies mentioned by Lilienthal, there are two which deserve especial mention, namely, Arsenicum and Veratrum viride. *Arsenicum* is almost certainly our most efficient remedy. Its symptomatology presents all the characteristic clinical features of septicæmia, and were it not that the disease is one in which the causative factor is a continuously existing one, the results would prove satisfactory. It should be given in doses of not less than one grain of the third decimal every hour, and after a time the dose may well be increased to as much as five grains at the same short intervals.

*Veratrum viride* is indicated by the character of the fever and the pulse. The fever runs a zig-zag course, and the pulse is rapid and of low tension.

*China* is useful in the tincture for the prostration and profuse sweating.

*Echinacea* is very largely used by Western physicians, who claim good results from it. I must confess my doubts as to its efficacy.

*Pyrogen* is very much used empirically by the ultraists of our school. So far as any reported results from it are concerned I must express grave doubts as to either its value or its homœopathicity.

## Plague.

**Prophylaxis.**—The trend of scientific investigations is in favor of the theory that the plague is propagated, to a certain extent at least, by a special variety of flea which infests rats. At any rate, it appears to be tolerably certain that rats play an important part in the spread of the disease. The practical lesson to be derived from this is, in epidemic times, special attention must be paid to the destruction of rats in ships arriving from infected ports. In vicinities where the plague is raging measures looking to the destruction of rats should be enforced. The bodies of the animals killed should be cremated as far as possible. Inasmuch as cats and dogs are in the habit of killing and devouring rats and mice, and may thus become centres of infection, these animals should likewise receive attention.

Insects, other than fleas, capable of disseminating plague are flies, bed-bugs, and ants. Flies carry the bacilli from place to place, even inoculating food; bed-bugs are harmless so far as their bites are concerned, but if crushed on wounds may readily produce infection. Ants usually get the bacilli from cadavers which have been improperly prepared for burial.

The specific agent in plague is eliminated in the urine, stools, sputum, and exudations generally. These discharges should, therefore, be watched with the greatest care, and thoroughly disinfected by mercuric chloride, 1:1,000, before throwing them away. The purulent discharges from the buboes are known to be highly infectious. Hence, the physicians and nurses in charge of cases should observe the greatest care in treating and dressing the same. It is known that infection may take place by way of

the skin. A very slight, an almost imperceptible, wound may afford an avenue of entrance of the micro-organism. It may be denied that any such wound existed. Experiments have demonstrated that such may exist and undergo complete healing before the disease is manifested. Infection may also take place by inhaling infected dust, or the ingestion of food containing the bacillus pestis.

The dried micro-organism of plague does not seem to possess very great vitality. It can survive but seven days in dust. In ordinary drinking water its vitality is very feeble, continuing but one day. In sterilized water it survives three days.

Plague patients should be thoroughly isolated under all the precautions previously inculcated as necessary in the care of contagious diseases. It is also important to maintain this isolation for one month after recovery, because the bacillus pestis is discoverable in the blood of patients for three or four weeks after all symptoms have ceased.

**Prophylactic Inoculations.**—The evidence thus far at our disposal seems to demonstrate that prophylactic inoculations of Haffkine's serum is a very efficient remedy. Thus, in Bombay, of 8,142 inoculated, but 18 took the disease, of whom 2 died. Of 4,926 inoculated at Dharwar, 45 took the disease, and 15 died; 3,387 persons were inoculated twice; of these, but two took the disease, and both recovered. Among the non-inoculated persons in these communities, there were from 657 to 1,000 deaths per week.

Other statistics equally good have been reported, so that in plague-stricken countries the serum is rapidly gaining the confidence of those best qualified to judge.

The prophylactic dosage of Haffkine's serum has been tabulated as follows:

| | Dose Marked on Bottle, 2.5 cc. | Dose Marked on Bottle, 5 cc. |
|---|---|---|
| Below 2 years, | 0.5 cc. | 1 cc. |
| 2 to 5 years, | 1 cc. | 2 cc. |
| 6 to 11 years, | 1.5 cc. | 3 cc. |
| 12 to 15 years, | 2 cc. | 4 cc. |
| 15 to 20 years, | 2.5 cc. | 5 cc. |

The administration of the serum is followed by certain phenomena, which are described on the official circular as follows: "The symptoms commence, as a rule, three to five hours after inoculation, and consist chiefly of swelling and pain at the seat of inoculation and a rise of temperature. The pain is felt particularly on movement of the part. The fever is accompanied by the general discomfort usual to this condition. No treatment of the symptoms is required beyond applying ice for the relief of headache, if any is felt, and enjoining some rest. General symptoms subside after twenty-four to thirty-six hours; the pain at the seat of inoculation lasts for three or four days, disappearing gradually; a painless in-

duration remains for some time longer. It is desirable to produce a rise of temperature to at least 102° F. If the reaction is less marked, the operation may be repeated three or four days with the same or an increased dose, according to the result of the first inoculation. There is no harm in leaving a longer interval between the two inoculations. No changes in diet or occupation are necessary, beyond, if possible, insuring some rest. Bathing in the open air should be avoided for some days. A simple purgative may be given twenty-four hours after the inoculation."

Some authorities advise systematic repetition of the dose after ten days have elapsed; and where the epidemic is unusually widespread three or four inoculations after like intervals. In view of the great mortality of the bubonic plague—80 to 90 per cent.—such precautions seem to be perfectly justifiable, despite the discomfort and temporary ill-health they cause.

**Treatment of the Patient.**—The curative serum of Yersin and Roux has been followed by excellent results. The dose should be from 30 to 50 cc. Two or even three doses may be required. The remedy must be administered hypodermically under full antiseptic precautions, both as respects the care of the syringe and the procedures incidental to the injection. Under its influence, the fever rapidly disappears and the buboes diminish in size. It is wise to repeat the injections until the patient is fully cured, as we may thereby avoid secondary infections.

Attempts at treating bubonic plague on antiseptic and surgical principles have been made, but with indifferent success. Prompt removal of the buboes has been tried and found useless. Calvert * asserts that the excision of the bubo is not only of doubtful service but may be followed by serious results. The opening of the buboes as soon as fluctuation appears is good practice. It is believed to be unwise to interfere until that period has arrived. The injection of carbolic acid and mercuric chloride does not seem to be of much if any benefit.

Nevertheless, the adminstration of antiseptics internally has had good results claimed for it. Thus, large doses of a pure carbolic acid, *e.g.*, three grains very few hours, has proven useful in reducing the mortality.

Plague patients are known to bear relatively large doses of Mercuric chloride without detriment. Syphilitic individuals under mercurial treatment exhibit a partial immunity, and when attacked by the disease present a milder form of illness.

Diluted cobra poison has been tried, and the cases thus treated have presented a mortality of 30 per cent. less than the average death-rate of the epidemic.

The homœopathic literature of plague is very limited. What there is has been compiled by Hughes † who mentions *Arsenicum*, *Lachesis*, *Naja*,

* Osler's *Modern Medicine*, vol. ii, p. 779.

† *Principles and Practice of Homœopathy*, p. 248.

and *Phosphorus* as the remedies with which East Indian physicians obtained the best results.

## Rabies.

(***Hydrophobia.***)

Rabies having developed the case is beyond any curative measures. All that the physician can then do is to relieve the suffering until death ends the pitiful scene. Much can be done in the way of prophylaxis. Accurately studied statistics have shown that 80 per cent. of those bitten by rabid animals die of rabies. Of those bitten and whose wounds are cauterized or excised promptly the death-rate is but 30 per cent. Of those treated first by excision and cauterization, and subsequently by the Pasteur prophylactic inoculations, the death-rate is but 1 per cent.

For purposes of cauterization, the actual cautery or the strong mineral acids should be used. Nitrate of silver is absolutely useless, for it is nothing more than an irritant of slightly more activity than tincture of iodine. Inasmuch as the poison is not always absorbed promptly—in fact its absorption may be delayed for twenty-four hours—surgical preventive measures as above outlined offer reasonable hope, even though delayed for a few hours. Even though the cauterization or excision is done late, it decreases the liability to infection, and also gives time for the removal of the patient to one of the Pasteur Institutes.

**Pasteur Method of Inoculation.**—For the following description of the Pasteur preventive inoculations for rabies I take pleasure in expressing my indebtedness to the *Reference Handbook of the Medical Sciences*, vol. vi, p. 834: "The principle of this treatment, or, rather, the object aimed at, is the rapid production of immunity in the patient during the period of incubation of the disease. If immunity can be established before the termination of the period of incubation, before any symptoms have developed, the progress of infection is arrested. The method consists in the inoculation once a day, for from fifteen to twenty-one days, with virus of graded potency. The virus employed consists of bits of the spinal cord of rabbits, possessing such potency by repeated passages through the central nervous systems of these animals that it produces death from rabies in nine or ten days in rabbits by subdural inoculation. As indicated on more than one occasion above, this constitutes the 'virus fixe' of Pasteur. The graded potency which is required, if the virus is to be used upon human beings, is obtained in the following manner: The spinal cord of a rabbit that has died of rabies on the ninth or tenth day after inoculation is carefully removed and hung up in a flask, at the bottom of which are placed a few pieces of caustic potash. Protection against dust, etc., is secured by stuffing sterilized cotton into the neck of the flask, which is kept in a dark place at a constant temperature. In this way the cord is subjected to a slowly advancing process of dessication, as a result of which the rabies virus is

rendered progressively less virulent. On the day following that on which the cord is introduced into the flask, it is spoken of as a cord of the second day, or No. 2. On the third day, it becomes cord No. 3; and so on up to the fourteenth day. After the fourteenth day, what remains of it, if not entirely used, is discarded. It is customary at the Pasteur Institute in Paris to use, for the first injection, an emulsion made from portions of the cord of both the fourteenth and the thirteenth days. In the New York Pasteur Institute, however, the first injection contains portions of the cord of the twelfth and eleventh days. An emulsion is made by rubbing up a segment of cord measuring 0.5 cm. in length in 6 cc. of normal salt solution (sterilized) for one patient. Two separate injections are made simultaneously, one in the right and the other in the left hypochondriac region. Each succeeding couple of injections is made with a stronger emulsion, that is, with an emulsion made from a segment of the cord that has been subjected to one day less of drying than the preceding one. The most virulent cord used in Paris is that of the third day; in New York, that of the second day. The time for using this is reached somewhere between the seventh and the tenth days, and then a return is made to the cord of the sixth or fifth day, after which a gradual increase is again made until the cord of the third or second day is reached. But if the treatment has been deferred for any reason, so long that there is danger of the disease developing before the entire series of injections can be administered one day apart, the interval between the injections is shortened and two or more injections of increasing strength are given daily instead of one each day for the first three or four days. Finally, when the case comes for treatment very late, and the necessity for such treatment is very urgent, it is maintained by some that all the thirteen or twelve injections should be administered in twenty-four hours, or that the preliminary injections should even be dispensed with entirely, and virus of full potency administered from the start. The procedure mentioned last, the use of attenuated 'virus fixe' without any preliminary inoculation with attenuated virus, has been practiced with good results in cases of persons bitten by wolves, the most dangerous of all forms of infection. This procedure is condemned by the Pasteur Institute as well as by the New York Institute, as it has caused several deaths."

No case of well-authenticated rabies having been cured, it is wise to direct our main treatment to the relief of suffering. To this end, the patient should be placed in a darkened room with one or two efficient nurses. Every measure for the promotion of rest and quiet should be enforced. For relief of the spasms, two drugs stand out prominently as the most efficient. They are Chloroform by inhalation and Morphia hypodermically. The ordinary nerve sedatives, as Chloral, Potassium bromide, Chloralamid, etc., are utterly useless. Some have advocated the administration of Hyoscine hydrobromate, gr. $\frac{1}{200}$ to gr. $\frac{1}{100}$, every three or four hours.

*Cantharis* and *Belladonna* present in their symptomatologies symptoms suggestive of rabies. Nevertheless, they are absolutely useless in the fight against this terrible disease.

If it is desirable to feed the patient, the spasms of the throat may be quieted by applications of Cocaine; or this being impracticable, rectal alimentation may be instituted.

## Anthrax.

(***Wool-sorters' disease; charbon; malignant pustule.***)

This disease originating, as it does, in the lower animals, especially in cattle and sheep, calls for prophylactic measures looking towards the prevention of its spread to human beings. The infectious agent resides not only in the discharges from the sick but also in the bodies of animals dying of the disease. Notwithstanding the fact that the proper antitoxin may prove curative, it is a wise procedure to kill promptly any animal discovered having the disease. All discharges should be collected and burned. The bodies of the dead should be cremated, as the spores of anthrax are very resistant and continue active many years, notwithstanding deep burial. Unfortunately, the spirit of commercialism prevents the above simple measures from being enforced. Hides are regarded as valuable assets, and to their owners it matters little if in their handling disease is transmitted to human beings. Nearly all of the infected hides are imported from Russia and South America. Knowing the danger of stock received from these localities, it is the rule in some manufacturing centres to take precautions for the protection of employees. Among these are the following: Noxious wools and hairs shall be steeped and washed in hot suds and sorted while damp. Others which are dry and dusty shall be assorted over wire boards provided with dust-extracting fans. All dust, remnants of hair and skins shall be burned. Workmen engaged in sorting the wool shall desist from work if they have any abrasions of the skin, especially of the hands. It would be much better, of course, if all bales were subjected to the disinfecting influence of steam under pressure for several hours, as this would at once put a stop to all danger; but this course has been objected to as liable to spoil the skins.

Veterinarians should observe the greatest precautions in making autopsies on animals dead of anthrax, as the slightest abrasion or cut offers a very favorable opportunity for infection.

There seem to be differences of opinion among authorities as to the efficiency of injections of the toxins and vaccines of anthrax as a means of conferring immunity. Some express the highest faith in them; others regard them lukewarmly.

**Treatment of Anthrax.**—To be successful, the treatment in a case of developed anthrax must be applied early. Even then it is not likely to be of value when the focus of infection is the lungs or intestines. Still, it

has not been denied that well-authenticated cases of the latter have recovered, few in number though they may have been.

In case the lesion is situated on the external surface of the body it should be treated by local excision and thorough cauterization with pure carbolic acid. The subsequent management should be based upon the ordinary principles of surgery.

Working on the fact that the anthrax bacillus does not thrive on a temperature much above that of the human body, some have advocated the application of hot poultices. Their temperature should be from 120° to 130° F., and they should be renewed frequently, so as to maintain as high a degree of heat as possible in the tissues about the lesion.

As to internal anthrax, we can only follow the procedures of various clinicians who have treated cases with some degree of success. The outlook, however, is so bad that Bramann and his pupils have advocated a purely expectant plan, even in the external variety. Fischer * reports one case treated successfully with intravenous injections of Collargolum solution. No other treatment was adopted. Five cc. of a 1 per cent. solution were injected into the cephalic vein. During the course of the evening the patient had a severe rigor, but slept well after a severe sweating, and he felt better in the morning. A second injection was employed on the following evening. The next day the progressive œdema had begun to recede, and after five days the pustule was practically healed. The patient left the hospital in good health after a stay of three weeks and a half.

Carbolic acid solutions enjoy high favor in some quarters. Scharnowski treated 28 cases successfully with hypodermic injections of this remedy, obtaining good results in every instance. The strength of solution employed varied from 2 to 5 per cent., and the daily quantity administered reached as high as 0.7 gramme. Such large doses do not seem to be detrimental, for anthrax patients exhibit great tolerance of the drug.†

When it has been discovered that patients have taken infected meat the only means at our command is early emesis, followed by brisk purgation.

The homœopathic remedies suggested include *Lachesis*, *Arsenic*, *Anthracinum*, and *Secale*. Unfortunately, our literature bearing on this subject is very meagre and very little can be said.

## Tetanus.

The outlining of an authoritative treatment for tetanus is surrounded with unusual difficulties. It is impossible, for example, to accept conclusions obtained from the small series of cases which have been observed by

* *Munch. Med. Wochenschrift*, Nov. 19, 1901.

† If a pure Carbolic acid, *e. g.*, Merck's crystallized, which has not undergone any discoloration is used, much larger doses may be given with safety. In a fatal disease like internal anthrax we are justified in taking chances to effect relief or cure.

any one individual, for it may have been his good fortune to meet with cases of mild character, in which case his results must be highly favorable ; or he may have been equally unfortunate in encountering severe cases with correspondingly bad results. Then, too, the disease presents great variations as to intensity at different times.

Concerning prophylaxis, there is much to say that is of value. At the time of the reception of a wound which is of a character liable to be followed by tetanus, the surgeon should make it a point to open up the wound thoroughly, irrigate freely with mercuric chloride, 1:1,000, and apply antiseptic dressings. It is a good plan also to give a prophylactic injection of the tetanus antitoxic serum, which all authorities now admit is efficient in doses of five to ten cubic centimetres.

With the advent of the first symptoms of tetanus, something may still be expected by surgical measures. The wound, which in all probability had been treated inefficiently at first, should be reopened to its smallest ramifications. It is good practice to go even farther and excise the tissues surrounding it. It is well known that the tetanus virus is present in the wound only, and at that point it continuously secretes the toxins which are taken up by the system. Opening of the wound and excision of its base must, therefore, be good practice. The good effect of incision and excision must be added to by thorough irrigation with bichloride or Carbolic acid solutions.

The value of early wound treatment has been experimentally determined by Babes and Kitasato.

Escharotics to the wounds are to be regarded as worse than useless, for these form a protective crust, and as the tetanus bacillus is anærobic, a soil favorable to its growth is thus created.

Amputation of the wounded extremity was strongly advised many years ago and then fell into disrepute. Recently, this method of treatment has been revived, but with the recommendation that judgment be exercised as to its practice. If good results are to be obtained from the operation it should be performed at once. Unfortunately, it so happens at this time that the full seriousness of the situation is not appreciated, and amputation is refused by the patient. Performed later, it is not only likely to prove useless but exposes the patient to the danger of death from shock. When the wound happens to be on a finger or toe the objections to amputation are not apt to be strenuous, nor is the operation sufficiently severe to provoke shock.

Of the hygienic measures for the tetanus patient, the most important is absolute rest for all the senses. The patient should be put to bed in the quietest room in the house. The room should be darkened. His ears should be stuffed with cotton to deaden any sounds that may enter. The floor should be well carpeted, and the nurse should wear light slippers.

Drafts of air must be excluded from the room. The nurse should conduct herself so in the performance of her duties as to disturb the patient as little as possible.

Digestion is very defective in tetanus patients. Hence, great care must be exercised in the selection and administration of food. The best articles of diet are of a liquid and semi-solid character. If trismus is present a wedge should be kept between the teeth to afford space for the administration of food. Should the difficulties of feeding be so great as to threaten starvation it may prove to be the part of wisdom to anæsthetize the patient, and with the œsophageal tube introduce sufficient easily digested nourishment, *e.g.*, peptonized milk.

Hypnotics have been advised by most old-school authorities, but without much enthusiasm. Of this class of remedies, Opium and its preparations seem to be attended by the least danger. Bromide of potassium and Chloral have also been recommended, but do not give satisfaction.

Bacelli's carbolic acid treatment is one which can do no harm, and as it does not interfere with the results of internal medication or the tetanus antitoxin may be used as a routine measure. It consists of injecting one to two and a half drachms of a one-half per cent. carbolic acid solution along the spinal column, beginning at the neck, and repeating the dose every two hours. Bacelli's results were truly remarkable, but have not been duplicated by others. It has been suggested that the tetanus of Italy is not of so severe a type as that observed in other countries. Symmers * collected 75 cases treated by Bacelli's method. Of these 58 recovered, the mortality being but 22.6 per cent. Certainly, this compared with the average accepted mortality of 88 per cent. is to be regarded as highly gratifying, though far from ideal.

My own experience respecting this treatment leads me to recommend it as the one offering us the best prospect of success. Failures are undoubtedly due in some instances to the administration of insufficient quantities. Since Goodno † has shown that large doses of the pure drug may be given with safety, we should not hesitate to give 20 or more grains daily, if the two-hourly administration of 30 minims of a 2 per cent. solution fails to bring the desired relief. At the same time, the physician must remember that in a disease like tetanus, which is in its natural course progressive, the keeping of the paroxysms from growing any more severe or frequent is tantamount to improvement.

Concerning the antitoxin treatment, the greatest differences of opinion prevail. The great majority of authorities seem to doubt its utility. The following results have been reported in the journals: Lund, in 167 cases, a mortality of 39.5 per cent.; Haberling, in 43 cases, 44.2 per cent.;

* *American Medicine*, 1903, p. 276.

† *Hahnemannian Monthly*, March, 1907.

Schuhmann, in 76 cases, 47 per cent. Judging from the experiences of others, however, one is almost forced to believe the above figures are taken from selected cases. The tetanus poison seems to combine so intimately with the tissues as to make their neutralization very difficult. The quantity of antitoxin required should be quite large; some have used as much as 250 cc., and the tendency is to employ even larger doses in the future. Intracerebral and intraspinal injections have been practiced by some surgeons, but thus far the results have been decidedly disappointing. One great objection attendant upon the antitoxin treatment is the delay in obtaining the reagent in localitites away from the trade centres.

Strychnia is the leading homœopathic remedy in tetanus. It has also been used by old-school authorities, Stillé reporting 8 cases cured by material doses of the drug.

*Aconite* is also homœopathic in tetanus. Tardieu reports a case in which this drug produced the following symptoms: "The fingers and the forearm were well-flexed, the arms rigidly brought backwards, as in opisthotonos, the head and trunk were thrown back, respiration arrested, the face cyanotic, consciousness lost, and the pupils enormously dilated. The convulsions were more continuous than in tetanus itself." Hughes quotes 9 cases treated by Aconite, of which 8 recovered.

*Hydrocyanic acid* has the endorsement of Hughes, Hempel, and DeMoor. In the Hydrocyanic acid case the reflex excitability is much less than that calling for Strychnia.

*Passiflora incarnata* is a favorite remedy in the Barbadoes. Dr. Archibald Bayne* reported 2 cases cured by this remedy. Lindsay and Pharos, of Louisiana, have used it successfully in tetanus neonatorum.

Eclectic authorities have reported successful results with Gelsemium and Lobelia. Waterhouse† cured one case with the former, giving 30-drop doses by the mouth every hour, and 30 drops hypodermically every six hours.

Thomas‡ lays stress on the use of Lobelia by the rectum, giving 1 or 2 drachms of the tincture in this way in combination with 30 drops of the tincture of Gelsemium.

## Glanders; Farcy.

The only practical treatment of glanders is the prophylactic, for the results in case of the fully developed disease are anything but favorable. Fortunately, preventive measures are very efficient, and but for the cupidity of certain unprincipled owners of horseflesh the disease would soon become a thing of the past. Practically, the only source of infection is the *equidæ*. As soon as the disease is discovered in one animal in a stable it should be killed and its carcass burned. The remaining horses should be

* *Hahnemannian Monthly*, vol. xv, p. 265. † *Eclectic Medical Journal*, October, 1891.

‡ *Practice of Medicine*, p. 260.

carefully watched, and the mallein test applied. If they fail to react, they may be accepted as free from the disease. The employment of the mallein test is an important diagnostic adjunct, for it is possible for an animal to have a slight lesion producing few or no symptoms, thus making it an unconscious source of continued infection.

The stall occupied by the diseased horse should be very thoroughly disinfected by scrubbing with bichloride, or, better still, destroyed.

The mallein test is applied as follows: 0.5 cc. of the undiluted or 5 cc. of the diluted mallein solution are injected hypodermically. No reaction follows in case the animal is healthy; but if it has glanders there follows a rise of temperature amounting to from two to four degrees, a large inflammatory swelling with œdema appears about the site of the injection, and the animal shows constitutional illness in the shape of loss of appetite, general weakness, and tremors. The mallein test has not been used for diagnostic purposes in the human being with sufficient frequency to determine its safety and value. In the lower animals it is now regarded as a reliable guide by veterinarians generally, though there still remain a few authorities who deny it much value or reliability.

The majority of cases of glanders occur in hostlers and others who work among horses. It is important that they should observe the greatest precautions in handling or caring for suspected animals.

It must be remembered, also, that the disease is communicable by man to man; hence the importance of the utmost care in destroying all the discharges from the sick.

If the infectious discharges should lodge upon a wound or an abrasion the parts should be irrigated at once with a bichloride solution of 1: 1000, or, better still, excised, and then irrigated. If a mucous surface has come under suspicion the irrigating fluid should be a solution of potassium permanganate.

The developed lesions of external surface and mucous membrane should be treated on ordinary principles of antiseptic surgery.

The patient's diet must be as nutritious as his ability to digest and assimilate will permit, and it may be necessary to make free use of stimulants.

Little of an authoritative nature can as yet be said of the serum treatment of glanders. Hell's observations do not prove anything more favorable than an ability to immunize horses against glanders. The same has been claimed for the mallein treatment. Chenot and Picq cured 7 out of 10 inoculated animals by the injection of the serum of cattle, which animals possess a natural immunity to glanders.

Internal medication in glanders is probably useless, though the hopelessness of the disease should not cause us to abandon our efforts on behalf of the patient. It must be conducted very largely upon symptomatic

grounds. Those which have been suggested include *Kali bi.*, *Mercurius*, *Crotalus*, *Arsenicum*, and *Kali hyd.*

## Syphilis.

The wonderful efficiency of the mercurial preparations and potassium iodide in the treatment of syphilis has led most unfortunately to the disregard of hygienic measures in the management of patients suffering from this disease. It is also unfortunate that the personal habits of the victims are such as to sadly stand in need of rigid regulation. While not relegating mercury and potassium to the background, I shall start this section on the treatment of syphilis by remarks concerning the personal and general hygiene of syphilis and syphilitic subjects.

The most important item is the prevention of the infection of the healthy. When one stops to consider the frequency of syphilis, the carelessness of its victims, and the readiness with which it may be transmitted, the wonder is, not that so many are accidentally infected, but that the whole of humanity has not become syphilized. Considerations relating to the comfort of the patient should not permit us to relax one iota in enforcing the most rigid preventive measures. Needless to state, sexual intercourse should be positively forbidden as long as the patient exhibits a single active lesion. Close personal contact, as in kissing, is dangerous, especially when the mouth and lips are the sites of ulcerations. Patients should use their own utensils for eating and drinking. When perchance they are forced to drink at a public place, they should not permit the edge of the cup or glass to come in contact with the buccal mucous membrane, and should rinse the receptacle thoroughly when they have finished with it. A small pocket cup is even better and more convenient than these precautions.

The personal habits of the individual should be such as are consistent with the maintenance of the highest standard of general health. To this end, excesses of all kinds must be forbidden positively; especially should the patient limit himself in alcoholic indulgence. Indeed, it will be wise if he abstain altogether, although the indulgence in light wine at meals occasionally is harmless. His supply of tobacco must also be limited, not only because of the local irritating influence of this plant on the mouth and throat, but also because of its depreciating influence when indulged in to excess.

The diet should be a generous and mixed one in order to maintain good nutrition. At the same time, care must be observed not to overtax the digestive apparatus. Constitutional dyscrasias, as tuberculosis, gout, rheumatism, etc., must be given due consideration. As a depreciated nervous system has a bad influence over the progress of syphilis, it is necessary that the patient avoid worry and anxiety as much as possible. While the

patient should be impressed with the importance of systematic and long-continued treatment, he should be encouraged by being fully informed as to the benign character of syphilis in the majority of cases. When possible, he should be restricted in his hours of work, or even directed to take a vacation, where enervating agencies may be avoided.

A chancre having appeared, the first question is the possibility of managing the case so as to abort or even prevent entirely the manifestations of syphilis. To this end, the early excision of the primary lesion has been suggested. The results from this are not very flattering. Nevertheless, there have been a few cases in which excision was practiced, and constitutional manifestations failed to develop. Fournier believed that excision has been successful in about 20 per cent. of the cases in which it has been tried. The great majority of syphilographers are most emphatically opposed to the procedure, and attribute the occasional successes to mistaken diagnoses. Notwithstanding the doubtful results it is good practice to give the patient every chance possible, and to excise the chancre when it has come under observation within two or three days after its appearance, and when it is situated on the prepuce or external integument, and there is no involvement of the inguinal or other lymphatic glands.

While acknowledging that excision does not prevent constitutional infection, some syphilographers make the claim that the operation greatly lessens the severity of the subsequent symptoms.

Cauterization, so much in vogue years ago, is now regarded as absolutely useless.

In the first stage of the disease, that of the initial sore, the treatment should be largely expectant. Mild local measures, tending to keep the diseased part clean and promote healing, and internal medication directed to symptomatic and general conditions are, as a rule, the part of wisdom. Whether or not to give mercury at this time is an important question. On this subject we find the greatest differences in professional opinion. No one will deny that the drug given at this time is capable of lessening or even preventing entirely the evidences of infection. And it is just this fact that makes the early administration of mercury unwise, for how can we then determine the natural type of the disease, whether benign or malignant, or even how can we determine that our patient is syphilitic? To some physicians this may seem an unimportant matter as long as the patient is satisfied and maintains good health. Experience will teach all that positive knowledge as to infection is of the greatest possible value in dealing with the patient in future years. When the circumstances are such as to make the continued existence of the sore a peril to others, as in the case of married patients, chancres on the fingers of surgeons and obstetricians, or where the sore is in a prominent position, as on the lips or nose, or when a pregnant woman is the patient, early and energetic constitutional

treatment is advisable. Otherwise, it should be postponed until symptoms of general infection, as glandular enlargement and syphilodermata, appear.

The treatment then consists in the administration of Mercury in one of its forms. As to which form individual opinions differ greatly. With the majority of men the preparation is a matter of small moment. I myself have a decided preference for the iodides, the biniodide or the protiodide. Of these, one tablet of the first decimal of the former or two tablets of the first decimal trituration of the latter may be administered three times daily. Their use should be continued until symptoms have abated or the constitutional symptoms of the medicine are manifested. Under no circumstances, however, is the use of the drug to be persisted in to the detriment of the general health. With the appearance of the slightest salivation the dose should be reduced to the limits of safety. It should then be continued until all manifestations of the disease have disappeared.

Up to this period of the treatment there can be no differences of opinion as to the proper course to pursue. It is now we reach the point where authorities disagree. A few contend that Mercury should be administered only so long as symptoms are present. That this plan does not give satisfactory or ideal results is well shown by the experience of those who have had to do with the later manifestations of syphilis, because they find that the majority of such patients have dallied with treatment just sufficient to keep symptoms in abeyance, and as a result have suffered from numerous relapses. This plan, therefore, has but little in it to commend it to us, though backed by a few excellent authorities.

The plan of procedure more generally accepted than any other is to continue the Mercury in about one-half the dose required to produce physiological action for a period of not less than eighteen months. In the meantime, the patient must be kept under careful observation, so that the dose may be increased immediately upon the appearance of the slightest syphilitic manifestation of any kind. Some syphilographers make it a practice to interrupt the administration of Mercury by the mouth from time to time, and order it by inunction for a period of two weeks, whereupon they return to the buccal administration. The argument for this course lies in the possible inability of the alimentary tract to absorb the drug after long periods, and that rest of the alimentary tract from medication is a good thing.

After a period of two years have elapsed without symptoms of any kind the Mercury may be safely discontinued, though the patient should be watched with more or less care. It is certainly wise that he submit himself to an examination of his nervous system at periods of six months, for it is in this direction that we have the most to fear after such a long period of quiescence. Such examination relates mainly to the condition of the pupils and the deep and superficial reflexes. Some have advocated that the com-

pletion of the mercurial course should be followed by one of Potassium iodide in small doses (grs. xv–xxx daily) for an additional period of six months. What is to be gained by this I cannot see, and so do not endorse it.

Ordinarily the administration of Mercury by the mouth is all sufficient. Circumstances may arise, however, demanding that other methods of administration be employed. These include hypodermic administration and inunction. The latter is especially valuable. I can well recall a case of meningitis occurring during the secondary stage of syphilis in which the patient was unconscious, and in which Mercury thus administered undoubtedly saved his life. The best preparation for inunction is the officinal *Unguentum hydrargyri.* Ordinarily this is too thick for ready use and should be diluted with cosmolin. A portion of this mixture equivalent to one drachm of the officinal ointment should be well rubbed into the patient's skin each evening. Not less than twenty minutes or half an hour should be taken in this process. Different parts of the body should be selected for the successive evening applications; thus, in turn, the treatment may be applied to the axillæ, the groins, the inside of the thighs, the back, the calves, the front and side of the chest, and the buttocks. If the rubbing is done by a nurse or masseur, the latter should wear rubber gloves for self-protection from drug effects. If done by the patient, as it can be done excepting over the back, such a precaution is unnecessary. If properly performed the inunction treatment should produce physiological action of Mercury within ten days to two weeks, when it should be discontinued or the quantity of ointment reduced. It is important that the patient keep his skin in good condition by thorough washing and bathing before each seance. The principal objection to the inunction treatment is its uncleanliness; but its manifest advantages when Mercury by the mouth is inefficient or disagrees and in unconscious patients are too evident to require a further defence of the method.

Of the preparations of Mercury for hypodermic administration, my experience has been limited, and relates only to Lang's gray oil. The results were satisfactory. The preparation was open to the serious objection that after standing some time the particles of mercury settled to the bottom, thus making the oil an uncertain medium for reliable dosage. Since then Lang has modified his formula, the fatty medium being of such a nature as to be solid at ordinary temperatures. Just prior to using, it is heated sufficiently to be taken up by the hypodermic syringe and used for injection. Lang's latest directions for preparing the gray oil are as follows: "Lanolin is dissolved in a large quantity of chloroform and rubbed up with mercury; we then add to the latter a double quantity of lanolin. As the chloroform evaporates during the trituration a mercurial ointment in the proportion of two to one is obtained—*Unguentum cinereum lanulatum forte.*

"This basic ointment, which contains mercury in excess and less lano-

lin, is used for the preparation of an oleum cinereum containing 50 per cent. of mercury. This preparation containing 50 per cent. consists of two parts of mercury and one part each of lanolin and oil.

"The gray oil should be kept in a small wide-mouthed bottle of a capacity of 10 to 15 grammes, supplied with a well-fitting glass stopper, and is placed in a large powder jar impervious to air and dust and kept in a cool place. During the hot days of summer the powder jar may be placed in a vessel of cold water, if an ice-box or other cool place is not at hand . . . and the oil is thus kept solid."

The dose for injection is never more than 0.05 cc.—equal to 0.04 gramme of metallic mercury. This may be repeated every second or third day, and in cases presenting marked improvement every fifth day. "For a thorough mercurial course, from eight to twelve, rarely more, doses are necessary, while for the cure of relapses from four to six are sufficient."

While expressing a favorable opinion of Lang's preparation and its effects, I cannot but feel that he is altogether too enthusiastic an adherent of the hypodermic method; and that most of us will continue with administration of mercury by the mouth, reserving the hypodermic method for cases in which the commoner practice is inadmissible.

Those who do not care to go to the trouble of directing the preparation of Lang's gray oil will find in the hypodermic tablets of mercuric chloride a very efficient substitute, open as it is to the objection of being painful.

The hypodermatic treatment of syphilis has grown greatly in favor in America of late years, until, at the present time, it has the adherence of many men of eminence. The advantages claimed for it have been promptness of results, the certainty that the patient receives a suitable quantity of the drug under close medical supervision, the infrequency of relapses, the painlessness of the injections when properly administered, and the avoidance of the necessity of taking repeated doses of the drug each day by the mouth.

Objections to the treatment have been offered on account of the danger of abscesses and pulmonary emboli. Those who have had the greatest experience decry these so-called disadvantages and say they never occur if proper precautions are instituted.

The more modern preparations include the *Bichloride*, to which reference was made above, and the *Salicylate of Mercury*. The former is soluble, and requires administration at relatively short intervals, and hence is at a disadvantage. The *Salicylate* is insoluble, its absorption takes place slowly, and it need be given every week or fortnight only.

The proper situation for the injection is deep in the muscular tissue of the buttocks. The needle is plunged perpendicularly into the parts to the proper depth; the syringe is then disengaged from the needle for a few

seconds to make certain that the point of the needle does not project into a bloodvessel, it is then reattached, and the preparation injected. The following is the usual formula:

| | |
|---|---|
| Hydrargyri salicylat., | gr. xxiij. |
| Lanolin, | gr. xv. |
| Oleum olivæ, | m. ccxviij.—M.. |

Of this preparation, from 5 to 15 minims are injected once a week; 5 minims represent one-half grain of the Mercury salicylate.

The hypodermatic treatment of syphilis must be conducted with the same care as is necessary in oral administration lest the constitutional effects of the drug be too severe.

The needle used should be two inches in length, and of greater calibre than that used with the ordinary hypodermic syringe.

Attention to the ordinary details of antiseptic technique is usually all that is required to avoid unpleasant after-effects.

In those cases in which pulmonary embolism has occurred, a localized pneumonia results, which runs a favorable course.

Many physicians advise the conjoint use of hot baths and mercury, and recommend their patients to take a course of treatment at the Hot Springs of Arkansas. Such advice, to say the least, is of questionable value. The time-honored custom among the wealthier classes of resorting to this place for treatment has given the physicians there great experience in the management of syphilis, and it is this experience—by no means to be ignored—that the main advantage of the Hot Springs lies. Another advantage is that the patients are away from home and business cares, and can devote themselves to the important duty of getting well.

After the second year of the disease Potassium iodide is generally a better remedy than Mercury, and is the more certainly indicated, as the manifestations of the disease are delayed. For the nervous and visceral lesions of syphilis it is the remedy *par excellence*. But it must be administered in suitable doses, the suitable dose being the one that will do the most good. In many of the tertiary lesions ten grains, three times daily, will prove sufficient. In the case of nervous and visceral syphilis much more than this quantity is required. Ofttimes it must be administered in doses limited only by the patient's tolerance. The quantities required in nervous syphilis in particular are often incredible, as much as one-half to one ounce of the drug daily being required before a satisfactory result is attained.

I have referred to the question of the tolerance of the patient for the drug. It has been my personal experience to find that syphilitic subjects exhibit a remarkable tolerance for the remedy. This statement is not intended to be dogmatic and without exception, for occasional exceptions will be

noted. It is a fact that the majority of non-syphilitics will experience coryza, excessive bronchial secretions, acne, etc., within a few days after taking such small doses as ten grains, three times daily; and I have seen physiological action follow within a few days after taking but nine grains daily. When such symptoms appear, as they sometimes will, in syphilitic subjects, it has always been my plan to disregard them, and to continue to push the iodide. The wisdom of this course has been proven by the disappearance of the intolerance and the rapid recovery of the patient.

The administration of Potassium iodide can be successful only when there is careful attention to detail. I would not pretend for one moment that it can be administered in hap-hazard fashion. The practice of leaving the remedy in the hands of the patient without skilled supervision is to be mentioned to be condemned.

Potassium iodide is best dispensed in the form of saturated solution, of which each minim represents three-quarters of a grain of the crude drug.

The best plan is to begin with the administration of five minims three times daily, well diluted and after meals. On the second day this is increased to ten minims three times daily. On each day or alternate day thereafter the daily dose may be increased by thirty minims, until at the end of the first week the patient is taking from 150 to 180 grains daily. Then further increase in the dosage may be deferred until the action of the drug has been determined. It is rare indeed that a smaller dose than these is curative in the cases of nervous and visceral syphilis. It is very rare indeed, moreover, to find these large doses to disagree. As an example of what may be done with this drug, I may instance a case in which my directions respecting the increase in the dose were misunderstood by the nurse, and the total daily doses reached the extravagant amount of 5 ounces of the saturated solution daily, with the result of curing the worst case of syphilis of the cranial nerves I ever encountered.

Sometimes these large doses do disagree, but invariably, in my experience, such intolerance has been the result of faulty technique. Thus, in one case, the drug was given undiluted and on an empty stomach. The patient declared that the suffering from the remedy was worse than the disease, and I am sure that he was right. Sometimes the case has been started with too large a dose, or the quantity has been increased too rapidly. Sometimes there has not been sufficient dilution. The large dose should always be taken in a full glass of water, and should be followed immediately by another glass of water. Sometimes the intolerance is largely imaginary on the part of the patient; sometimes it is due to a bad stomach. Should the drug continue to disturb the stomach despite free dilution and administration after meals, we still have the remaining resource of adding five grains of bicarbonate of soda to each dose. My experience with Potassium iodide in visceral and nervous syphilis has been a very

large one. I have yet to meet with the first case in which I could not secure tolerance and administration of the drug without detriment to the patient. That I have seen serious effects from its maladministration I do not hesitate to acknowledge. These have always resulted from neglect of the precautions above inculcated. Patients have taken the drug before meals, or have continued its use long after having passed from the physician's care.

A good result having been obtained, as is usually the case, the use of the drug should be continued for a long time after the disappearance of symptoms. The dose should, however, be greatly decreased, only to be added to on the slightest warning of a return of symptoms. The physician must be the sole judge. I have seen relapses result from too early cessation of medication; and I have seen inability to control relapses dependent apparently upon no other cause than the continuance of the drug without medical supervision over a term of years.

There is one class of complaints in which the use of Potassium iodide is debatable, I refer to the parasyphilitic disorders, such as general paralysis of the insane and tabes dorsalis. My experience favors the drug even in these, though it is but seldom that I have continued the drug for longer than three months at a time. It usually brings with it temporary improvement, but in the end the pathological process progresses and death claims the victim.

The contention that the effects of Iodide of potassium and Mercury can be confounded with those of syphilis by a skilled clinician are too absurd to be entertained for a moment. Such mistakes are the result of ignorance.

While protesting my failure to having seen a case of syphilis non-amenable to Mercury or Potassium iodide, I am far from contending that such cases do not exist, for the evidence to that effect is incontestible; but such cases are rare. The Sarsaparilla compounds may then be suggested, together with enforcement of dietetic and general hygienic details. Of the Sarsaparilla preparations, the best are Zittman's decoction and an infusion prepared fresh daily from a strictly reliable bark.

Zittmann's decoction is prepared as follows: *

"*Decoctum Zittmanni fortius.*—Take of sarsaparilla root, cut, 100 parts; digest in water 2,600 parts for 24 hours, and add, inclosed in a linen bag, powdered sugar and alum, each 6 parts, calomel, 4 parts, and cinnabar, 1 part; then heat in a covered vessel placed in a steam-bath for 3 hours, stirring frequently, and near the end of the boiling add anise and fennel, bruised, each 4 parts, senna, cut, 24 parts, and licorice root, cut, 12 parts. Express, strain, set aside for some time, and decant to obtain 2,500 parts of clear liquid; 2,500 grammes of this are to be divided into 8 parts.

* *The National Standard Dispensatory*, p. 527.

"*Decoctum Zittmanni mitius.*—Take the residue left from the preceding and 50 parts of sarsaparilla, heat with water 2,600 parts for 3 hours in a covered vessel, placed in a steam-bath, stirring frequently, and, when near the end of boiling, add lemon peel, Chinese cinnamon, cardamom, and licorice root, each cut and bruised, 3 parts. Express and operate as before to obtain 2,500 parts."

Zittman's decoction acts first as a laxative and then as a tonic. It has been used for the most part in broken-down syphilitic subjects who no longer react or who exhibit an intolerance to mercury and Potassium iodide. It is usually found sufficient to give the mixture for a fortnight in order to obtain from it its full beneficial influence.

The dose is from two to six fluid ounces, three times daily. Morton * recommends that the patient be given half a pint of the stronger formula for the first four days, and as hot as possible, at 9, 10, and 11 A.M., and at 12 M. "On the same days at 3, 4, 5, and 6 P.M., half a pint of the milder decoction, which is taken cold. The patient is kept in bed, excepting for an hour every evening, when he may sit up. On the fifth day he is given a hot bath and allowed to get up. In the evening two pills are administered, the patient starting the decoctions again on the next day as before. This treatment goes on in the same way until the fifteenth day, when it is discontinued."

Occasionally, other remedies, notably Aurum mur., Thuja, Sulphur, Silicea, Asafœtida, Nitric acid, Arsenicum, Hepar, Iodine, Fluoric acid, and Mezereum are of value for special indications.

*Aurum muriaticum* is regarded by many physicians as indicated in cases in which Mercury fails to do the work expected of it. At any rate, the two drugs are very similar in their activities. It may be given in the secondary stage for the ulcerations of the mouth. Later, it is indicated in nasal syphilis, when there is caries of the bones with offensive discharges. Among the nervous manifestations of syphilis, Aurum is useful for mental depression.

*Thuja* has as its field certain local manifestations, as moist excrescences or condylomata on the prepuce and glans and whitish chancres.

*Silicea* is indicated by reason of its general affinity for caries of bones and chronic suppurative lesions.

*Asafœtida* is likewise suited to cases of caries or necrosis, especially when involving the tibia and associated with nocturnal pains. Ulceration, when present, is attended by considerable sensitiveness and a thin offensive sanious discharge.

*Nitric acid* is indicated in ulcerations which display active progress; also in mucous patches. The ulcerations display ragged raised edges and

* *Genito-Urinary Diseases and Syphilis*, 2d edition, p. 453.

are attended by splinter-like pains; irregular ulcers in the throat with sticking pains; yellowish brown or copper-colored spots over the body.

*Hepar sulphur* is generally regarded more as an antidote to the abuse of Mercury than as an antagonist of syphilis *per se*. Nocturnal pains, chilliness, sensitiveness of the ulcerations, which discharge a thin pus, and alopecia are its special indications.

*Mezereum* is used almost exclusively for bone affections of syphilis. Pains involve the shin bones, and are worse at night; periostitis; sensitiveness to slight manipulation; syphilitic neuralgia.

Occasionally one meets with cases of syphilis in which, notwithstanding the systematic use of the above-named remedies, the patient does not progress satisfactorily. Under such circumstances, one is ready to grasp at any new suggestions. That of Robinson * to the effect that *Pilocarpine* will prove an invaluable adjuvant is worthy of consideration. He argues and claims that experience has demonstrated the truth of his conclusions, that the administration of Pilocarpine in doses ranging from $\frac{1}{32}$ to $\frac{1}{8}$ of a grain, twice or thrice daily, will bring remarkable relief to the ptyalism of mercury, and will aid the rapid disappearance of the various syphilides. Mercury should be suspended while giving the Pilocarpine. The author claims that the drug acts as an eliminant.

Let me say in closing this chapter that antisyphilitic medication can only influence truly syphilitic lesions. Thus, a gumma of the brain disappears promptly on the administration of Potassium iodide. But if that gumma has been permitted to grow sufficiently large to destroy adjacent brain structure by pressure, such brain tissue must remain forever lost.

Another practical point connected with the administration of the Iodide relates to a device to prevent the patient knowing what he is taking. To disguise the appearance of the solution, I have several times stained it with a watery solution of eosin in the proportion of one drop to each ounce of Potassium iodide solution. Caramel may also be utilized for the same purpose.

Does improvement of symptoms under a course of potassium iodide prove the syphilitic origin of the disease? In the majority of cases it does, especially if the cure is complete. But on many occasions I have seen remarkable improvement follow in non-syphilitic lesions, notably in three cases of sarcoma of the dura mater. In most cases of syphilitic origin the result from the administration of the drug is so rapid as to be almost sensational.

If the above plan of treatment strikes my readers as unnecessarily crude, it is only necessary to remind him of two facts: First, that the results from it are good; and, secondly, that Mercury and Potassium are admittedly homœopathic to syphilis, and the dose, as a matter of principle, becomes a secondary consideration.

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* *Medical Record*, June 15, 1907, p. 988.

## The Treatment of Hereditary Syphilis.

By C. SIGMUND RAUE, M.D., Clinical Professor of Pediatrics, Hahnemann Medical College, Philadelphia, Pa.

In the treatment of hereditary syphilis there are two salient points which must always be kept in mind : First, that syphilis is a chronic affection and requires long-continued treatment, and, second, that hereditary syphilis is, in the majority of cases, a most virulent disease with a high mortality rate. We are not in the habit of looking upon syphilis as a fatal disease, but those of us who see a good deal of this affection in the hereditary form soon realize its gravity, and learn to appreciate the sociological importance which it has assumed. When we pause to consider that fully one-half of all infants born of syphilitic parents die within the first month of life, and that of those who survive this period a large number die in early infancy, we are brought face to face with an appalling condition. We have here a preventable disease, in the majority of instances aquired through illicit intercourse, which is responsible for 10 per cent. of the deaths in the first year of childhood.

These observations lead us to the conclusion that there must be something radically wrong to account for such a large number of cases. In other words, syphilis in the parent is either too often improperly treated, or these patients are too frequently allowed to marry before their disease has been controlled. Furthermore, we must realize that unless active and in some instances actually heroic treatment is employed little can be expected so far as results are concerned.

In the question of remedies, there is practically no difference between the treatment of syphilis in the infant and in the adult. For the active manifestations of the disease mercury will always be the leading remedy. Not only is it homœopathic to the disease, but its clincal value is beyond dispute. When special symptoms are encountered which do not correspond to the pathogenesis of mercury, the appropriate remedy must, of course, be selected as in any other chronic affection.

Before entering into a discussion of the special indications for the various remedies useful in syphilis, a few words as to the general management of these cases will be in order. In the first place, we must not lose sight of the fact that hereditary syphilis is fully as contagious as the acquired form, and that the child's attendants must be apprised of this fact in order that they may take every precaution against becoming infected. I am personally acquainted with the case of a nurse who acquired syphilis in this manner from an infant she was attending. The mother, according to Colles' law, is immune, at least in the majority of instances ; nevertheless, if she is nursing the babe, her nipples should be carefully looked after, and if they become abraded or fissured a nipple shield should be employed as a matter of precaution.

The infant's nutrition is of the greatest importance in these cases, and the outcome depends largely upon the feeding of the child and the state of its digestion. If breast milk cannot be obtained, cow's milk, properly modified according to the infant's age and the state of its digestion, should be substituted. Proprietary foods should be avoided, and under no circumstances should a wet-nurse be exposed to the danger of infection with the disease.

**Remedies.**—*Aurum Metallicum.*—Tertiary manifestations; exostoses on the skull, tibia and bones of the forearm; dactylitis with ulceration; caries of the nasal bones; defective development of the sexual organs; infantilism.

*Baryta Carb.*—Persistent glandular enlargements; squamous syphilides.

*Hepar Sulph. Calc.*—Hepar has always been looked upon as a most efficient antidote to the ill-effects of mercury, but aside from this it is a valuable remedy for many of the constitutional manifestations of syphilis. Its well-known influence over suppurative processes makes it useful in pustular skin conditions and in the early stage of bone necrosis.

*Kali Bichromicum.*—This remedy is particularly useful for the catarrhal conditions encountered in syphilis. There is stoppage of the nose and ulceration of the mucous membranes, the ulcer having a punched-out appearance; ulceration of the nasal septum with perforation; Kali bichromicum, like Kali hydriodicum, follows well after mercury.

*Kali Hydriodicum.*—In the later manifestations of hereditary syphilis the Potassium iodide must frequently be employed in material doses. It is not always necessary to employ this remedy in massive doses; there are authentic cases on record in which Kali hydriodicum in one of the dilutions has given excellent results. When the symptoms are urgent, especially in lesions of the nervous system, we must give a sufficiently large dose to control the condition rapidly. Whether this shall be five, ten or even twenty grains three times daily rests entirely with the judgment of the physician. Cases that have been treated properly from the beginning rarely require large doses of Potassium iodide. Speaking of this remedy in hereditary syphilis, Cobb says: "It can frequently be well followed or replaced by the Iodide of Calcarea or the Iodide of Arsenicum in lesions of the glands; by Silicea or Zincum metallicum or Sulphur in those of the nervous system; and by Hepar sulphur or Aurum metallicum or Nitric acid in those of the osseous system."

*Mercurius.*—Hughes, in his *Pharmacodynamics*, clearly points out the action of mercury in syphilis, namely, its influence over local lesions, as well as its beneficial effect upon the patient's general condition. This remedy, being truly homœopathic to syphilis, not only controls local manifestations, but also exerts a tonic and hematinic action in the disease.

Pathogenetically, it corresponds to the diffuse inflammations and infiltrations of the skin, mucous membranes and other structures, the tendency to breakdown and ulceration being marked. Ordinarily, we may give the remedy by the mouth, but when the symptoms are urgent, as they frequently are in the hereditary form of the disease, we must get a quick action of the drug if we wish to save the case. For this purpose *inunctions of mercurial ointment* (ten grains daily) may be employed. Recently I have been impressed with the superiority in desperate cases of the *hypodermic injection* of mercury as extensively used by my colleague, Dr. L. T. Ashcraft, in the genito-urinary clinic at the Hahnemann Hospital, Philadelphia. Ten minims of the *sozoiodolate of mercury* are injected into the gluteal muscles, the dose being repeated every three or four days until results are obtained.

*Mercurius iodatus flavus* 2x trituration, two grains three or four times daily, is the preparation I usually begin with in ordinary cases. Later, if ulcerative lesions predominate, I prefer the *Red Iodide*. The *Bichloride*, in the third decimal trituration, I have found particularly useful in cases associated with intestinal disturbances, and when the mucous membrane of the mouth is in an unhealthy condition. The mouth and lips of these infants sometimes look bright red, as if the mucous membrane were entirely denuded of its epithelium.

*Mezereum.*—Pustular eruptions forming thick, brownish crusts, with oozing of pus; painful at night; swelling of the shafts of the long bones; syphilitic neuralgia.

*Nitric Acid.*—Deep irregular ulcers on the borders of the tongue; on the tonsils and the soft palate; sticking pains in the ulcers; rhagades at the angles of the mouth; pustular and squamous syphilides; mercurial stomatitis and cachexia; urine of a strong ammoniacal odor; condylomata about the anus and genitals.

*Sulphur.*—Syphilitic children often require an occasional dose of sulphur for special symptoms or as an intercurrent remedy. The symptomatology of Sulphur is too extensive to be discussed here. Its sphere of action embraces both local and general manifestations.

*Thuja* is credited with being useful for condylomatous lesions.

## Pulmonary Tuberculosis.

The treatment of pulmonary tuberculosis, as well as of tuberculosis in general, resolves itself into the prophylactic and the curative. The prophylactic measures include those to be adopted by the authorities for the protection of the community at large, personal measures for the protection of individuals, and precautions by the victims of the disease lest they infect the healthy.

The institution of proper measures for the prevention of tuberculosis

demands a knowledge of the avenues of infection. These include: 1. Inhalation; 2. Ingestion by way of the alimentary tract; and 3. Inoculation by wounds.

1. **Infection by Inhalation.**—This is unquestionably the most frequent way by which tuberculosis of the lungs is acquired, and in practically all cases the infectious agent is derived from the sputum of tuberculous patients. True it is that the tubercle bacilli may be derived from other sources, but they are so insignificant in comparison with the main cause that they may, for the present, be ignored. While it is hardly a proper thing to turn one's back to the consideration of any influence that is capable of adding a single death to the mortality of tuberculosis, the public mind becomes so greatly wrought up over numerous possibilities that it loses proper consideration of the main factor in the spread of pulmonary tuberculosis, namely, the far and wide dissemination of the tubercle bacillus by the expectoration of patients. It has been estimated by one investigator that a tuberculous patient is capable of discharging in his sputum seven billion tubercle bacilli in the course of twenty-four hours. All of the micro-organisms are not of equal virulence, and many of them are dead or so deficient in vitality as to be incapable of transmitting the disease. Nevertheless, there is always a sufficient number of them so actively virulent, as to make expectoration of the consumptive dangerous—to others as well as to himself. Especially dangerous are ambulant patients, for they, unless properly instructed and trained, have every opportunity for spreading the disease wherever they may happen to travel. As proof of this statement, we have data which demonstrate that the permanent residents of resorts frequented by the tuberculous are infected with the disease in greater frequency with succeeding years.

Tuberculous sputum does not, as a rule, become dangerous to others until it is dried and mingles with the dust of streets and dwellings. The vitality of the dried tubercle bacilli may be maintained for a long time, varying according to the physical conditions they encounter. Exposed to sunlight and fresh air, as in the streets, they may perish in a few hours or days. Protected by the poor light and ventilation of some dwellings they remain active for many months.

The dissemination of the tubercle bacilli by flies is also a matter demanding consideration as an etiological factor. These insects obtain access to tuberculous sputum in cuspidors and elsewhere, gorge themselves upon the same, contaminate their bodies externally with infectious diseases, and so become a means for spreading disease broadcast. This they do in two ways: 1. It has been proven that the viscera of flies fed upon tuberculous sputum contain the active bacilli. These insects die, and their dried remains mix with the general dust of streets and dwellings. Their excrement, deposited upon walls and fabrics, is also known to contain active bacilli. 2.

By crawling over articles of food which are good culture media for the bacillus, and by depositing their excrement upon the same, they afford opportunity for infection by way of the alimentary canal.

2. **Infection by Ingestion.**—The principal danger in this direction lies in partaking of food-stuffs derived from tuberculous animals. This subject has been argued pro and con with considerable energy. After all has been said, it must be admitted as beyond question that insufficiently cooked meat or milk from infected animals is capable of spreading tuberculosis. So convincing is the evidence bearing on this point that we are in duty bound, as hygienists, to insist that all tuberculous animals be destroyed. The greatest danger lies in the milk of tuberculous cattle, as it is especially dangerous to infants and young children, not only because milk is their main nutriment, but also because the delicate epithelial lining of their intestinal tracts is peculiarly vulnerable to the tubercle bacillus.

Consumptives working in certain trades having to do with the preparation of food articles have unlimited opportunities for infecting their products if they are at all lax in proper precautions. To this class belong butchers, dairymen, milkmen, bakers, grocers, confectioners, cooks, and some others. Indeed, it is a question if tuberculous subjects should, in the interests of public health, be permitted to follow any of these vocations. Careful though they be, they are fairly certain to lapse occasionally from the path of hygienic virtue, and one such lapse destroys the purity of their wares, and their patrons of that day suffer the consequences.

The possibility of spreading the disease by kissing has been debated. Theoretically, the probability of thus infecting others is strong. Practically, we find very few cases arising in this manner. Undoubtedly the repeated and prolonged caresses of infants by mothers, and the too ardent osculations of lovers are dangerous. But as long as human nature continues to be human, unsentimental hygienists must fail to eradicate this source of infection. We must satisfy ourselves by giving proper advice and placing the responsibility where it belongs.

It may be pleasant for users of tobacco to learn that the workmen in cigar factories moisten the cover of the cigar to retain it in place, and if he is tuberculous he may deposit the tubercle bacilli on the cigar. In fact, the possibility of such a result has been demonstrated.

3. **Infection by Inoculation.**—This is comparatively rare, though sufficiently frequent to be a real danger. It may occur through operation or autopsy wounds when dealing with tuberculous subjects, from wet-nurse to child or child to wet-nurse, the sexual relation, ritual circumcision, and tattooing. The danger of spreading tuberculosis by vaccination is practically *nil.* In the first place, manufacturers have so much capital at stake that they cannot afford to place any but pure vaccine virus on the market; and, in the second, it seems to have been pretty conclusively proven that a pure lymph is incapable of producing a tuberculous infection.

**Public Prophylaxis.**—The principal source of infection by tubercle bacilli being the inhalation of the dried sputum, it is to be expected that the authorities can do most in eradicating the disease or lessening its frequency by making and enforcing ordinances which shall prevent spitting in public buildings and on the highways. Such laws exist in a number of cities, but are not enforced. A few years ago, while in the Boston and Maine Railroad Station, I noticed numerous placards concerning the anti-spitting ordinance of Boston. Notwithstanding their prominence, I counted over one hundred fresh expectoration marks on the tiled floor-way of the entrance to the train-shed. It is to be feared that the habit of spitting has been so thoroughly engrafted on some people as to become an inseparable part of their personalities. To cause them to change their ways is practically impossible. With school children the matter is different. When still of a tractable age they should be made acquainted with the unsanitary character of this habit.

Public schools should be placed under careful supervision. While pulmonary tuberculosis is not frequent in childhood, nevertheless cases do occur, and if such are not excluded from the school-room, the most serious consequences can ensue. Such exclusion may seem a hardship to the patient. Really it is a blessing, for no case can be expected to recover when confined in crowded class-rooms for several hours each day. It is more than likely that many cases of tuberculosis in the young find their origin in the schools. It should be a custom to disinfect school buildings at regular intervals, say at the end of each week.

The greatest danger of the spread of tuberculosis lies in the unsanitary condition of many workshops and factories. Many such are very poorly provided with windows and ventilators ; hence, fresh air and sunlight are great strangers to their habitues. Let one of these people contract tuberculosis, and let him be careless as to his habits, and a veritable epidemic can be started almost before the original cause of all this woe is discovered. In places of this character the enforcing of anti-spitting rules is easy, for proprietors and superintendents can summarily dismiss the culprits without legal formalities. The infliction of a few penalties of this kind will make the denizens of the place careful. Notwithstanding the unsightliness of cuspidors, factories, stores, etc., should be well supplied with the same. The cleaning of these places should be performed at the end of the day, and not early in the morning, so that patrons and workmen will find the atmosphere free of dust.

Our Pullman sleeping-cars with their heavy draperies must be a frequent means for disseminating tuberculosis, for many of the traveling public are tuberculous. Such cars on lines going to famous health resorts must be especially dangerous. This evil can only be corrected by the officers of the railroad companies. It seems hardly possible to exclude the tuber-

culous as patrons. They can, however, be forced to observe certain regulations which apply to the entire traveling public, of which the anti-spitting rules are the most important. These cars should be liberally supplied with cuspidors, to be brought forth by porters on request by travelers. In very few cars do we find them excepting in the smoking compartments. All mattresses, bed-coverings and draperies should be thoroughly aired and disinfected after each trip. The disinfection can be readily accomplished in a short time and at low cost by formaldehyd.

Streets and pavements should not be swept without previous sprinkling. Fortunately, the discomfort of the public when forced to inhale clouds of dust raised by street cleaners has for a number of years been obviated. The practice so common among women of wearing skirts which trail the ground, gathering dirt and excrementitious materials of many kinds, and carrying them into homes, cannot be regulated by law or common sense. Those who submit to such senseless styles are beyond the pale of either.

Two classes of institutions are especially prone to propagate tuberculosis, namely, the prisons and the insane asylums. Over them close governmental supervision should be had.

The question of the propriety of notification of cases of tuberculosis to health boards is a matter for legitimate debate. Much can be said in its favor. Against it is the unnatural phthisiophobia such action will foster in a community. We fail to see, moreover, how it can be made to confer any benefit on the community. It can do much good in the matter of acquainting the authorities with the location of the buildings in which tuberculosis is generated. It is a well-known fact that tuberculosis clings to certain houses and localities in a community. It is reasonable to suppose that when such places have been recognized the disease in their midst can be removed. In the absence of notification laws, it seems to me that much benefit would ensue if boards of health made it an invariable rule to thoroughly disinfect every house before occupation by a new tenant. Real estate agents would readily co-operate with the authorities in enforcing the law.

The ridiculousness of State supervision over the tuberculous becomes evident when we come to consider the investigations of Burkhardt, who has shown that tuberculosis is practically universal in persons over the age of eighteen. To use the words of an editor of *Progressive Medicine*,* his observations serve "as a further confirmation of the practical rule that where tuberculosis of the lungs seems a reasonable probability it is practically certain to be present." If, therefore, we start a quarantine, if we institute measures which should unintentionally cause the laity at large to shun the tuberculous, we practically place the entire world under the ban. Certainly, this brings the State supervision of the tuberculous to a *reductio ad ab-*

* March, 1907, p. 164.

*surdum*. Autopsies on 190 children showed a frequency of tuberculosis of 38 per cent. Of 1,262 autopsies upon adults "there were but 113, *i. e.*, 9 per cent. free from tuberculosis, and Burkhardt is inclined to believe that even these 113 had tuberculosis, but the focus was so small that it was overlooked, even though most carefully searched for."

Special measures should be instituted for the care and disposal of the bodies of the tuberculous dead. Galtier has demonstrated that the tubercle bacilli resist putrefaction for several months; Gärtner that it is capable of exerting its infectious properties after one year's burial; and Schöttlius claims an extension of activity under such conditions for two years. Earthworms are known to be capable of ingesting and ejecting the tubercle bacilli without destroying them. Compulsory cremation would solve the problem; but this is impracticable in the present state of public opinion on the question. Probably the current practice of embalming with formaldehyd solution is a sufficient corrective of the danger.

Much has been said in literature concerning the education of the public. Exhibitions have been given and lectures have been delivered, but all the effect that follows these is the production of a phthisiophobia and the glorification of those concerned in the crusade. The poor and underfed who reside in the byways of large cities have neither the time nor the inclination to attend, and it is to these the information for self-protection is necessary. Again, we cannot give the public a full education concerning the etiology of tuberculosis; all that we can hope to do outside of a medical education is the little knowledge which the proverb tells us is a dangerous thing. One valuable fact learned, if it ever is learned, is worth a lot of half truths or misinterpreted facts. As to tuberculosis, the one fact and the only fact for the public to know is that *tuberculous sputum is dangerous*. Then let the physician teach his patients the methods by which he obviates any chance of harming others. The reformer is by nature an egotist. One of this class—an ardent phthisiotherapist—has made the assertion that he has never met a general practitioner who knew how to warn the afflicted concerning the methods by which they might become dangerous to others.

Everything can be said in favor of laws or public sentiment which will prevent phthisical subjects from engaging in occupations which have to do with the handling of food supplies, as cooks, milk dealers, grocers, provision dealers, childs' nurses, etc.

**Personal Prophylaxis.**—The personal precautions to be adopted for the prevention of tuberculosis may be considered under two headings: 1. Measures to be enforced by those believed to be predisposed to the disease in order that they shall maintain freedom from infection; 2. Measures to be adopted by the tuberculous to prevent reinfection of themselves and the spread of the disease to the healthy.

**Measures to be Enforced by Those Believed to be Predisposed.**—In considering this heading, the first question quite naturally is, "Who shall we consider as predisposed to infection?" In view of the undoubted tendency of tuberculosis to run in families, we must unhesitatingly place on the list of the predisposed all persons of tuberculous parentage. The predisposition must be believed to be especially great in those instances where the child was born of a mother already tuberculous. We are also justified in including all members of a household where one member has already contracted the disease. In this case, however, the principal precautions to be adopted should be by the invalid in taking care of his expectoration. Lastly, we may include among the predisposed persons who develop a stature disproportionate to their age, and who, at the same time, possess narrow chests, are bad eaters, more or less anæmic, and have poor digestive capacity. Ofttimes, such individuals are muscularly strong and athletically inclined; though, as a rule, the reverse condition obtains. Such persons are apt to take cold readily; and when thus stricken the acute catarrhal affection is apt to involve the finer air-passages, and convalescence is slow.

It should be the rule for tuberculous parents to take early steps looking to the prevention of the disease in their offspring. The mother should, during her pregnancies, follow strictly all the hygienic rules for that period. The value of fresh air for the infant must ever be borne in mind. No maudlin fears should lead the little ones to be brought up as hot-house plants. On the contrary, they should be given abundance of fresh air. Every day, in fact, they should be out for a prolonged airing. The beneficial effects of the air should not be hampered by *heavy* veiling of the face. A light veil sufficient to break the force of undue cold or wind, and applied so as not to interfere with nasal respiration, is all that should be permitted.

If a child is found to be a mouth-breather, the cause of that condition must be corrected at once. In the majority of cases it will be found to be post-nasal adenoids or tonsillar hypertrophy, or both. But other intranasal conditions may be active, as deviated septum, turbinated hypertrophies, septal spurs, etc.

If the patient is a bad breather, systematic respiratory exercises should be enforced. Those which I have employed for several years past are the following:

*Exercise* 1. The patient is directed to stand perfectly erect with his hands and arms hanging by his sides. He then slowly raises his arms and hands until they are on a level with his shoulders. While doing this he makes a slow and deep inspiration. In this part of the exercise he just as slowly brings his arms down to his side, at the same time making a slow and forcible expiration. To one not accustomed to this exercise the first attempt is apt to excite cough, and it may be some breathlessness. Four

or five repetitions are about all that should be advised at the first seance. The exercise should be repeated two or three times daily. When it can be performed without incovenience, the patient is ready for

*Exercise* 2. The initial portion of this exercise is identical with number one. Instead, however, of ceasing the upward movements of the arms when they reach the level of the shoulders, they are carried upwards over the head on a line with the vertical axis of the body until the palmar surfaces meet. The inspiration is more prolonged than in exercise number 1, in that it is not permitted to terminate until the complete upward movement of the arms is completed. The arms are next brought downwards slowly until they drop by the patient's sides, a deep expiration keeping pace with the movement. This exercise is to be repeated three or four times daily, and four or five times at a seance, for a couple of days, when exercise number 3 may be added.

*Exercise* 3. The patient stands erect with both arms at the level of his shoulders and with palmar surfaces of the hands in contact. He then slowly swings his arms apart, each describing a circle of ninety degrees. This brings the arms to the final position attained in exercise number 1. While doing this he inspires slowly. The arms are then slowly returned to the starting-point, accompanied by a slow and deep expiration. This exercise is easy of performance, and having been mastered the patient is ready for number 4, which is more difficult than any of its predecessors.

*Exercise* 4. The first portion of this exercise is similar to number 3. The object is to swing the outstretched arms with hands in contact to as far a position posteriorly as possible without disturbing a perfectly erect posture. The patient stands as in exercise 3 and then slowly swings his extended arms backward through an arc of one hundred and eighty degrees until his palmar surfaces touch behind him. This movement is accompanied by a slow and deep inspiration. The returning movement to the initial position of the arms is associated with a deep and slow expiration. As a rule, it will be several days before this exercise is performed without difficulty. Then we may proceed to

*Exercise* 5. The patient stands erect with his hands resting on his sides at the level of the crests of the ileum. With a long, steady inspiration he slowly arches his body backwards as far as possible without disturbing his equilibrium. The return movement is accompanied by a deep expiration.

*Exercise* 6. The patient stands as in exercise number 5. He then inclines his body slowly to one side, accompanying the movement with a deep inspiration. With the return to the upright attitude he makes a deep expiration. The same movement is then repeated to the opposite side of the body.

The instruction to patients should cover the time, place and frequency of exercises. At first, they should be practiced but three times daily,

morning, noon and night. Beginning with short seances, of four or five repetitions of the first exercise, their duration should be gradually increased until each seance should consume ten minutes. In no case, however, should they be continued to the point of weariness or breathlessness. When a good opportunity presents itself they should be practiced in the open air. They should never be undertaken when tired, after a heavy meal, or with tight clothing.

Next to the care of tuberculous sputum, fresh air and sunshine are the deadliest foes of the tubercle bacillus. Hence, as a matter of general hygiene if for nothing else, houses should be well-ventilated, and the silly habit of darkening rooms should be discarded. Ventilation without exposure can be accomplished readily by the use of numerous ventilators, which may be placed beneath the window-sash without exposing the occupants of the dwelling to drafts. As to dark rooms, just so long as fashion dictates that this shall be done the pernicious practice will continue,

*Hydrotherapy* is a valuable adjuvant in that it hardens the individual and most decidedly lessens the tendency to "take cold." Beginning with the earlier months of infantile life cool sponging followed by brisk friction is most useful. Older children and adults may practice cold ablutions of the neck and shoulders, or even a daily cold douche.

The anæmia of the tuberculously disposed is dependent in most instances upon faulty breathing habits, bad ventilation, insufficient or badly selected food, and disregard of general hygienic measures. It yields, therefore, to the conditions which tend to build up the constitution and the removal of bad hygienic influences. Very important is the regulation of diet. The majority of tuberculous subjects give a history of poor appetite for a term of years prior to the outbreak of active symptoms. Many have been in the habit of partaking of candies, sweets, pastry, and other contraband articles. The foods upon which they should subsist include merely the ordinary nourishing ones of everyday life, as beef, mutton, bread, butter, milk, eggs, and the general line of fresh vegetables. Much of the bad appetite is mere habit, and can be overcome by education and judicious coaxing. Sometimes it is not relieved until the patient is forced into an open-air life.

Certain diseases are notorious for the frequency with which they are followed by tuberculous infection; so great a frequency, indeed, that one cannot doubt their ability to produce a predisposition. This list includes many of the infectious diseases of children, notably measles, whooping-cough, and scarlatina. In adult life, influenza is the most dangerous in this respect. It is therefore incumbent upon practitioners to give convalescents from these diseases every opportunity to regain their accustomed standard of health before permitting them to pass from medical supervision.

The tuberculously predisposed should select occupations with care.

Such as necessitate a life indoors in poorly-ventilated shops and offices must be avoided. Those which bring the patient into the open air for the greater part of the time are to be advised.

**Prophylactic Measures to be Adopted by the Tuberculous.**—This question is too much neglected by the tuberculous, as they are apt to regard it as of value only to others and not to themselves. This is a serious mistake. It must be borne in mind that there is such a thing as reinfection of persons already the victims of the disease. This may take place in the same way as did the original infection, namely, the inhalation of tuberculous dust, or by careless disposal of the patient's own sputum, as by uncleanliness of clothing or toilet, and swallowing of the expectoration. Aside from this, the tuberculous patient must be forced to bear in mind that carelessness on his part is detrimental to the community, and that deliberate disregard of advice as to the disposal of his sputum is downright murder. Now I am not an advocate of such stringent regulations as to generate a phthisiophobia among the laity. While we cannot be too careful, nevertheless we can, in our enthusiasm, go to extremes. Of course, it is *possible* to transmit tuberculosis by the breath in the act of talking or ordinary breathing; but such modes of transmission are so rare as to make their disregard practically safe. On the other hand, the careless disposal of tuberculous sputum is such an evident danger that we sacrifice none of our duty as medical advisers and hygienists if we insist that patients must submit to instructions. Refusing to do so, we see no reason why such individuals should not be placed under the immediate supervision of health authorities, as no more safe to be at large than venomous serpents or beasts of prey.

Cornet, speaking on this point, says: "*A priori*, one might think it of slight importance whether a consumptive whose lung already contains millions of bacteria breathes in a few more or not. A careful consideration of the nature of tuberculosis infection brings to us a different conclusion. In cholera or typhoid, in which the whole gut is full of bacteria, it may, indeed, be of no consequence whether a few more are taken up with the food; in scarlet fever, variola, and syphilis, in which the entire blood is infected, a few more may be disregarded. But tuberculosis is a sharply localized disease, in which every fresh infection is of consequence. Nor can the inspired germs be compared with those in the sputum, since the latter are destined to pass outwards. If, indeed, the fresh germs were to find their way into a cavity or caseous focus, their arrival would not alter matters. But as a rule, it is healthy tissue and not the caseous focus which aspirates. When a bacillus finds its way into a healthy alveolus a newly formed tubercle becomes the centre of a fresh infection, and this is just as serious a matter as if the gut or some other organ had become involved. *The fallacy itself and the resultant policy of inaction should, therefore, be energetically opposed.*"

At the present time, with our knowledge that a very large proportion of cases of consumption are curable, there can be no harm in explaining the true nature of the illness to the patient. The habit of stating a fictitious diagnosis as bronchitis or apical catarrh is to be condemned. It rarely deceives the patient. It only makes him better satisfied with himself.

*The first duty of the consumptive is to take care of his sputum in such a way that it cannot dry before disinfection, and thereby infect the healthy persons in his family and community.* Indeed, if he does this alone with any degree of exactness a very long step will have been taken towards the stamping out of the disease.

How shall he do this? Ambulant patients must be made to carry spit-cups. Of those manufactured in this country, the pocket sputum flask devised by Dr. Knopf, of New York, and manufactured by the Kny-Scheerer Co., of the same city, is unquestionably the best. Its use should be reserved for such times as the patient has not a cuspidor available. Its construction is such that it need not attract the attention of bystanders to the user, for it can readily be hidden in the folds of a pocket handkerchief. It is a wise plan for the invalid to provide himself with two of these flasks that one can be used while the other is being cleaned.

Whenever a cuspidor is available, and he should provide his home with this utensil, he should expectorate into it. To give a maximum of advantage, cuspidors should be prepared with a certain amount of precaution. They should contain just enough water to keep the contained sputum from drying. To keep it nearly full of water defeats one of its objects, as then the act of expectoration will cause more or less splashing over the surrounding wash-boards and floorings. The use of saw-dust, sand, earth, and other materials in cuspidors is to be condemned, as they render the excrementitious organic matter more difficult of disposal and disinfection.

The recommendation that cuspidors be emptied into cesspools and water-closets without previous disinfection is not to be encouraged, although not likely to be productive of much harm. It is only when the tuberculous material becomes dry and mixes with the dust of houses and streets that it is dangerous. It has also been claimed that the bacilli soon die in the midst of putrefactive materials of a cesspool. Such a course is probably safe with ordinary cuspidors. But when they are known to be in use by a consumptive, the sputum should first be rendered harmless by a disinfectant. Of these, the best are 5 per cent. solutions of carbolic acid or mercuric chloride, 1:1,000. Should the latter be used, it should be in combination with tartaric or citric acid to prevent the coagulation of the albuminous constituent of the sputum. The germicide should be kept in contact with the sputum for not less than fifteen minutes.

After emptying, cuspidors should be rinsed and thoroughly boiled.

Patients confined to their rooms or bed should use paper spit-cups,

which can be burned at the end of each day and new ones supplied. Such spit-cups are manufactured by Seabury & Johnson.

Pocket handkerchiefs as a medium for the disposal of sputum cannot be condemned too severely. No better way can be provided by which sputum can be dried, reduced to dust and disseminated in the surrounding air. It may sometimes happen that the patient finds it necessary to use his handkerchief to wipe his lips after expectorating. For this purpose, he should have a special handkerchief, which he must carry in a pocket devoted to it exclusively. This pocket must be lined with rubber tissue or other impervious material, and should be so attached that it can be removed from time to time for cleansing and disinfection. The same handkerchief is also useful to hold before the mouth during the act of coughing.

The wearing of masks may be said to be the invention of the phthisiophobist. True it is that bacilli are thrown off during the act of talking, but they are insignificant in number as compared with the number escaping with expectoration. Fränkel's experiment demonstrated this. With a number of patients, and over a period of 32 days, and using 219 masks, he captured just 2,600 tubercle bacilli, while Heller has demonstrated that a single consumptive can expectorate over seven billions bacilli in a single twenty-four hours.

To avoid house infection by dust, it is a wise plan to have rooms cleaned by moist cloths, which should be afterwards disinfected or burned.

Tuberculous men should keep their faces well shaved. Beards and mustaches furnish convenient hiding places for bacilli, and media for lodgment and drying of sputum. In hospitals, the shaving of the faces of male consumptives should be a prerequisite to admission.

While bed-linen, etc., used by the sick is harmless unless soiled by sputum, it is a wise plan to make assurance doubly sure by soaking the same in a bichloride solution, 1:1,000, and boiling before using again.

**The Open-Air Treatment of Pulmonary Tuberculosis.**—Although the principles underlying the modern method of treatment of pulmonary tuberculosis in sanitoriums were promulgated over fifty years ago, their real value has been recognized for but a comparatively short time. Bodington, an English physician, in 1840 wrote an essay "On the Cure of Pulmonary Tuberculosis on Principles Natural, Rational, and Successful," in which was advocated the importance of an open-air life both day and night, judicious employment of exercise, and systematic feeding. Strange to say, he was regarded as but little short of a lunatic, and subjected to professional persecution. In 1855, Dr. Henry McCormac wrote on similar lines, and he in turn was made the subject of ridicule and abuse. Brehmer, in 1856, systematized the open-air treatment, basing his principles upon the conditions surrounding the methods of living of people among whom tuberculosis did not exist. He likewise met with great opposition, but persisted. The principles which he advocated may be epitomized as follows:

1. Constant life in the open air.
2. Freedom from all debilitating influences, mental and physical.
3. Systematic hill-climbing, as the most suitable form of exercise.
4. Constant medical supervision.
5. An abundant supply of food.
6. Hydrotherapy.

**Life in the Open Air.**—No matter what may be the condition of the patient, and despite inclemency of the weather, the patient must be made to live in the open air both day and night. Bad weather and unfortunate constitutional and local disturbances call for certain precautions for the welfare of the patient. Some regard must, of course, be had as to the patient's previous method of living. If he happens to be a person who has been brought up indoors, with abnormal care as to outdoor exposure, he must be carefully accustomed to the new life. In all but an infinitesimal number of cases it is possible to bring the patient to the amount of air desired within a week or ten days after commencing the treatment. If the temperature be febrile, it is important that the patient keep at absolute rest on a couch or reclining chair. If the sun is shining, his head should be screened from its rays. If there be rain or wind, he should be so placed as to avoid exposure to these elements. Despite seasonal and climatic conditions then he must be kept on veranda or lawn for from five to nine hours daily. At night, he should be harbored in a room, the windows of which should be open. If one of the windows is so situated as to expose the patient to a strong wind he should be protected by a screen.

The means by which rooms suitable for the tuberculous may be constructed are by no means expensive. Although apparently beyond the means of many patients they are much less expensive than a life of idleness and invalidism. I have one patient who had constructed for her a wooden shack overhanging the backbuilding of her home, at a cost but little greater than the lumber required. Now that there is a demand for buildings of this character, medical supply houses can furnish such devices as Tucker's tent, the Gardiner tent, and other structures of like nature. Usually, however, patients will find it better to construct a shack adapted to his dwelling-place, but under the supervision of his physician. Dr. G. Harlan Wells tells me of one of his dispensary patients who cured himself by spending the day in Fairmount Park, while at home he remained in bed in a room with wide-open windows.

Knopf* has invented a window-tent which insures the dweller within doors an abundant supply of fresh air. It is manufactured by the Kny-Scheerer Co., of New York City. "This window-tent is an awning which, instead of being placed outside of the window, is attached on the inside of

* Address to Conference of Sanitary officers of the State of N. Y., *N. A. Journ. of Homœopathy*, Sept., 1907.

the room. It is so constructed that the air from the room cannot enter or mix with the air in the tent. The patient lying on the bed, which is placed parallel with the window, has his head and shoulders resting in the tent. By following the description closely you will see that the ventilation is as nearly perfect as can be produced with so cheap a device. The tent is placed in the lower half of an American window but it does not quite fill the lower half of the frame; a space of about three inches is left for the escape of the warm air in the room. By lowering the window, this space can be reduced to one inch or less, according to need. On extremely cold and windy nights there need not be left any open space at all above the window-frame. The patient's breath will rise to the top of the tent, the form of which aids in the ventilation. The tent is constructed of a series of four frames, made of Bessemer rod suitably formed and furnished with hinged terminals, the hinges operating on a stout hinge pin at each end with suitable circular washers to insure independent and easy action in folding the same, the Bessemer rod being hardened to make a stiff rigid frame to insure its maintaining the original form.

"The frame is covered with extra thick yacht sail twill, properly fitted, and having elongated ends to admit of their being tucked in, under and around the bedding to prevent the cold air from entering the room. The patient enters the bed and then the tent is lowered over him. Or with the aid of a cord and a little pulley attached to the upper portion of the window, he can manipulate the lowering and raising of the tent himself. Shutters or Venetian blinds, whether they are attached on the inside or on the outside of the window, can be utilized in conjunction with the window-tent as a screen to intercept the gazes of the neighbors, and in stormy weather as a protection. The bed can be placed by the window to suit the patient's preference for sleeping on his right or left side, so that he has the air most of the time in his face. Another advantage of the window-tent is that it will not attract attention from the outside. The bed being placed alongside the window will be convenient for a majority of the poor who have small rooms. If, however, the bed must be placed at a right angle to the window, this can be arranged as well. A piece of transparent celluloid is placed in the middle portion of the tent to serve as an observation window for the nurse or members of the family to watch the patient if this is necessary. It also serves to make the patient feel less outdoors and more in contact with his family.

"There is one more benefit to be derived from the use of the window-tent that is not to be underestimated. Patients who can only be persuaded with difficulty to sleep with the window wide open will not hesitate when they have this tent as an inducement. Draft, which the consumptive patient usually dreads, particularly when he perspires and in cold weather, need not be feared when sleeping in the window-tent. The construction

is such that even should the shoulders be accidentally exposed the three tent walls protect the patient from violent currents of air which may be produced by leaving opposite doors in the room open. In this respect the window-tent even has an advantage over sleeping on porches when they are not properly inclosed."

If patients have no other place in which to construct a suitable tent they can make use of the roof.

By way of occupation, he may be permitted to read and write in moderation. The influence of these acts must, however, be carefully watched. It is unwise to authorize unlimited time spent in amusements, as at cards and other games. While some patients may indulge themselves thus with advantage, there are many more to whom the excitement incidental to games is detrimental.

Too prolonged maintenance of one position must be guarded against. For example, a long-continued, *i. e.*, three or four hours, supine position can do harm by inducing pulmonary hypostasis. Continued sitting with the back against a chair keeps that part of the body unduly warm, excites local sweating, and renders the patient liable to the ill-effects of exposure when the position is changed.

Sleeping while taking the open-air treatment must be carefully supervised. Tubercular patients are liable to sweat while asleep; hence, it is important to restrict them in this luxury, lest they "catch cold."

Knopf* more than any other author lays great stress on *helio-therapy*. For the practice of the sun-bath he gives the following directions:

"In a private home, where neighboring windows are often near, the arrangement will be more difficult, and low screens will have to be used. In winter the room should be heated to from 70° to 75° F. By and by, the patient's skin will be less sensitive to the air, and the temperature of the room can be decreased. The room must always be well-ventilated. In summer the upper part of the windows can be left open.

"The patient undresses entirely, but if he complains of cold feet he can keep his stockings and even his shoes on until he has become warm enough and desires to take them off. He places first a warm sheet around his body and then a large blanket; he then lies down on the floor in the sun, his head in the shade and slightly elevated by a cushion. As he begins to feel the warmth of the rays of the sun, he uncovers himself gradually until the whole of his body is exposed to the rays of the sun; he exposes his back by turning over on his chest. He remains in the sun-room for from half an hour to two hours, according to the direction given him by his physician. He may change the recumbent to the sitting position or walk about.

"Like all curative agents in the treatment of phthisis, the carrying out

* *Ibid.*, p. 503 *et seq.*

of this solar therapy should never be left to the caprice of the patient. Too much exposure to the hot rays may cause an erythema, an urticaria, or other cutaneous trouble. To prevent the latter the patient should cover himself with one or even two layers of his sheet when the sun's rays produce a slightly burning sensation. Should these cutaneous complications occur nevertheless, the sun-baths must be omitted for a time and the skin bathed in warm water, and friction with lemon juice applied. Headache, or a feeling of discomfort, is the signal to stop, no matter how short a time the bath has lasted. A high bodily temperature is, of course, a contra-indication to sun-baths. Such patients must remain in bed. Slightly feverish patients may be allowed to try solar therapy, but when experience shows that the baths are followed by an elevation of temperature, they must be discontinued.

"While taking his sun-bath, the patient should breathe deeply or take his regular breathing exercises."

2. **Freedom from All Mental and Physical Debilitating Influences.**—It is necessary to impress upon the patient from the very beginning that tuberculosis is a curable disease. This will do more than anything else to bring about an easy and cheerful frame of mind. He must be taught to regard the treatment with enthusiasm. Unless he learns to distrust prevailing morbid fears respecting his constant exposure to fresh air, a lack of mental ease must act depressingly upon his bodily functions.

Visitors should be permitted with judgment. In the beginning it is the best plan to exclude visitors entirely, even though those applying for admission are possessed of tact and discretion. It must be remembered that the conditions attendant upon the treatment are not such as to make outsiders thoroughly comfortable. After a short time, when the patient is thoroughly accustomed to his surroundings, and can look with equanimity upon his friends' intolerance of open air, they may be permitted; but it is the duty of physicians and attendants to make careful inquiries as to the results. No respect should be paid to the dictum of relatives that the patient will suffer from mental depression. We have heard much of this "dying of loneliness," but in actual experience it is never seen.

The physical conditions which tend to depress the bodily functions include sudden changes of temperature and drafts, bad heating arrangements, and exposure to wind and sun. These have all been commented upon in previous paragraphs.

In cold weather, with an insufficiently heated room, the patient may be permitted to close the windows while dressing and undressing.

3. **Systematic Regulation of Rest and Exercise.**—As to whether the patient shall be at complete rest or shall indulge in exercise must depend upon his physical strength, his temperature, and character and frequency of the pulse, and the effect produced by exercises already performed. Early

cases in which physical signs are but slight, fever absent, and pulse of good quality and practically normal frequency, may be allowed to follow their own inclinations, providing such are in the direction of activity, which should not be too strenuous. With them golf and short gunning and fishing trips are ideal. We may even advise for them, after they have been under close medical supervision for a time, and climatic conditions being favorable, a sojourn of three or four months of camp-life in the woods. It is only the already hardy patient who may be advised with any safety to take up such occupations as farming or ranching without previous training.

Patients who have fever must be kept at absolute rest. No amount of coaxing should permit the slightest departure from this rule. If the rise of temperature is but slight, *i. e.*, one degree or less in the evening, short walks may be permitted in the morning. If the fever is high, 100° F. or over, the patient should be kept in bed and in his room, but the positive injunctions already given as to an abundant supply of fresh air must be observed.

The pulse must be regarded as an equally good criterion as the temperature in the matter of regulating exercise. All patients with a pulse frequency greater than 100 per minute should be kept at absolute rest in bed for a prolonged period, and that irrespective of the temperature presented.

Again, when exercise, however mild, produces an increased pulse-rate, which does not subside within half-an-hour after taking rest, that exercise must be looked upon as excessive.

The blood-pressure must be watched as carefully as the pulse-rate. As shown by Wells,* the prognosis in any stage is the more unfavorable as the pulse tension is diminished. The causes of this lowered blood-pressure are the toxins from the tubercle bacillus and the lowered nutrition. Both of these deleterious agencies are to be combated by rest, feeding, and hydrotherapy.

With a weakened or anæmic patient exercise in the shape of walking is to be advised, but with the greatest possible precautions. At first he should walk but a few hundred yards, and these on the level. Their influence on temperature and pulse must be noted. If a rise above the normal takes place we know that the exercise is harmful. If the result is otherwise, the walks may be lengthened day by day. Brehmer advised gentle hill-climbing, and his advice stands good to-day as it was then. The patient should make it his rule to take the first part of the walk on the up-grade, that he may have the less exertion on the return trip.

Even slight exercise causes increased frequency of the pulse, but not over ten or fifteen beats per minute and that for a period not greater than ten minutes in the cases in which exercise is indicated. If the rapid pulse

* *Hahnemannian Monthly*, July, 1907.

persists for a longer period we must put an injunction on the harmful exertion.

With careful supervision in conjunction with the combined measures to be employed in the treatment of tuberculosis, the patient gains in strength day by day, so that he can take longer and harder walks, eventually resorting to more strenuous outdoor pastimes.

4. **Constant Medical Supervision.**—Here we have the rock upon which the hopes of many a patient are wrecked. "What," says the tubercular patient, "can be easier than staying in the open air for every hour of the day, leading a happy life, moving about and resting as my feelings dictate, eating plenty of good wholesome food, and attending to all hygienic details? What use have I for the doctor? I am not a fool, and can take care of myself." And we say that no patient can commit a graver error. So great indeed is the necessity of constant supervision that we should insist that the patient at first go to a sanitorium and learn at first hand the method of life he is expected to follow, or be placed under the care of an experienced nurse, who will insist upon the demands of the physician being carried out. Ups and downs must be encountered along the road to health, and the advice, the presence and the personality of the physician are necessary to steady the invalid's progress. Without the physician disorganization is only too readily encountered. But let the patient have one or two months of system and learn its value; the lesson having been taught will never be forgotten.

5. **Diet.**—The feeding of the tuberculous patient stands next in importance to the enforcement of the life in the open air. The tuberculous patient requires an abundance of food. This fact is by no means new, for many years ago Debove, Millard, and others taught that excellent results could be obtained by forced feeding through the stomach tube. The ordinary individual is supposed to receive food having a heat value of 30 to 35 calories per kilo; an effort should be made to give the tuberculous patient 45 calories or more per kilo. This is the theory. In practice we meet with numerous obstacles to the accomplishment of our ends. Many of the patients have bad appetites; others are the victims of weak digestion. Hence, in the question of dietetics, we are obliged to "fence" for a position. Food the patient must have, and food we must give. The easiest obstacle overcome is that of appetite, which usually makes a distinct improvement after a week or ten days of the open-air treatment. The weak digestion is oftimes very difficult to handle. In many instances it is an insurmountable obstacle. Diplomacy or tact must be exercised in forcing upon the patient articles of a nutritious character. This can usually be accomplished after a little study of the patient's tastes. With improved nutrition, it is customary for the patient to be less selective in the variety of his foods.

As in health, the ideal diet is a mixed one, *i. e.*, one composed of pro-

teids, fats, and carbohydrates. Monotony of diet soon destroys our aims. Likewise, improper methods of cooking and untidy serving exert a deleterious effect. The value of dietetic æsthetics is nowhere better exemplified than in the treatment of pulmonary tuberculosis.

Considering first the general principle involved, that of giving the patient such highly nutritious articles as meats, easily digested fats (as butter, cream, olive oil, and bacon), eggs, and milk. Under no circumstances should the patient take more than his digestion can master. It is a good rule to give smaller quantities at a time, and to feed at relatively short intervals.

Milk and eggs are usually the foods which can be managed best by the tuberculous patient, and hence it is that they have attracted attention to the neglect of other articles of diet. As a matter of experience, it is found that most patients when coming under treatment should be placed upon these articles exclusively; some may be permitted one solid meal daily in addition. The best results are obtained by feeding the patient five or six times daily.

The milk should be of exceptionally good quality. Indeed, its efficiency will be increased if cream be added to it. In the beginning the patient should take three pints daily. This quantity should be added to from day to day until he is able to take three or four quarts (providing he is not taking the general run of good solid foods). With the milk, eggs should be administered. At first the patient should take one raw egg three times daily. The number of eggs can be increased each day until the patient is taking a dozen or more eggs *per diem*. Many patients object strenuously to raw eggs, declaring that it is impossible to take them. A little persuasion usually overcomes the difficulty and secures a trial. The eggs should always be given with the yolks unbroken and in a cup, so that the vision does not add to the anticipated distaste of the egg. While there can be no question that eggs taken in this way are very readily assimilated, we must remember that they may become monotonous. Hence, we are oftentimes obliged to yield a point concerning the method of their administration. Thus we may give yolks alone (these constitute about 75 per cent. of the nutritive substance of the egg); they may be mixed with milk or made up as egg-nog; or they may be given cooked in various ways. *The important item is to get the food into the stomach in a way that will not disagree with the digestion.*

Difficulty is not infrequently encountered with the taking of milk, patients claiming that it has always disagreed with them. Tact and perseverance overcome this difficulty. Sometimes we are obliged to modify the milk, giving it peptonized, mixed with barley or lime water, or in the form of koumyss, matzoon, or kefir. It sometimes happens that though the milk is taken with a relish and agrees with the patient, it must be limited in

quantity or abandoned altogether, because it so distends the stomach that it impairs his appetite for more nourishing foods. This is a very important matter, for I and others have met with numerous cases where all chances of recovery have been ruined by a dilatation of the stomach from distention of that organ owing to the aggressive feeding carried out by enthusiastic phthisiotherapists.

When the time for enlarging the dietetic list has arrived, fresh vegetables should be ordered.

The question as to whether the patient is being fed properly is to be determined by his weight. If this increases satisfactorily each week we may rest satisfied. The physician should remember, however, that while increased weight usually goes hand in hand with improvement of the tubercular lesions, such is not invariably the case. Some notable instances of great weight with progressive destruction of the lungs have been observed; but they are in a decided minority.

In matters of feeding, success depends in many instances upon the nurse. Tuberculous patients are ofttimes notional—as much so, indeed, as cases of neurasthenia and hysteria—and require skilful manipulation before they yield the necessary points.

Some stomachs are unduly irritable and can tolerate but little food, vomiting ensuing. In several such I have made use of the stomach tube, following the lavage by a generous feeding of a highly nutritious liquid food, as eggs and milk, with most excellent results.

The question of alcohol in tuberculosis cannot be decided in a general way. It must be administered according to the indications in each case. Undoubtedly there are many cases in which it acts either as a food or aids in the assimilation of other food substances. In still others it is a plain stimulant. The majority of patients in the early stages of the disease are better off without it.

*Cod liver oil*, which for so many years enjoyed a reputation as the leading remedy for pulmonary tuberculosis is, after all, but an easily assimilated fatty food. It may be given in the form of one of the popular emulsions, or plain with extract of malt, always after meals. Some patients, though a minority, thrive better on *olive oil*.

6. **Hydrotherapy.**—The hydriatric measures to be instituted in patients with tuberculosis must vary with the general condition. In the so-called incipient or mild cases even he must exercise judgment in this respect. It is well to begin with tepid baths, which should be followed by brisk friction to get up a reaction and improve the cutaneous circulation. The temperature of this bath may be reduced from day to day as the patient's condition permits; but must never be carried to the extent of permitting the subsequent reaction to be followed by a chill. In vigorous patients, the hydriatric treatment may be pushed to the extent of cold

shower-baths with advantage; but such a bath should never be prolonged more than 10 seconds. *These cold douches or baths should never be permitted in patients who have had hæmoptysis.* They are also objectionable at times in the treatment of patients who have passed the age of 50 years. The best time for their administration is in the morning before breakfast, unless the patient be a light feeder at that hour; in which case they may be postponed until one hour after the morning meal (taken in bed).

Patients who are greatly debilitated should be treated with a dry rub, which is to be followed by sponging with alcohol, and in the course of several days with water.

With improvement in the patient's general condition, a sheet bath or cold water rub may be administered. In all cases it should be remembered that the standard for continuance of the particular hydriatric method is the appearance of a reaction following the treatments. Unless this occurs the treatment is likely to do harm.

7. **Climatotherapy.**—Since the sanitorium treatment of tuberculosis has become the recognized treatment of the disease, climatotherapy has become a very subordinate factor. Undoubtedly, sanitoria will give better results if located in regions possessing certain climatic advantages; but we know that good results can be obtained in almost any locality where fresh air and sunshine can be had. The factors which go to make up a desirable climate for the tuberculous include a purity of atmosphere with special reference to freedom from dust, plenty of sunshine, and comparative freedom from cloudy weather, and equable temperature, and, in the minds of most physicians, mountain districts.

Equally important, though seldom thought of until the patient has reached the place, are suitable accommodations for the sick and available medical talent.

The places which have attained the greatest reputation in the treatment of pulmonary tuberculosis are the Adirondacks, Colorado Springs, Denver, Southern California, Arizona, Asheville, Aiken, Texas, and the Pocono district in Pennsylvania.

Inasmuch as a very large proportion of cases of pulmonary tuberculosis make excellent recoveries, it is now accepted as an axiom that that climate which most nearly approaches that in which the patient expects to reside after recovery is the one he should select. This means that he should go to a sanitorium near to his home.

Popular prejudice, however, inclines the wealthy in particular to demand a change of climate, to accede to which is by no means always wise. Incipient cases may go to a suitable climate with advantage, providing they place themselves under proper treatment on their arrival. Cases of tuberculosis which have advanced to the breaking down of lung tissue are unquestionably better off at home.

8. **Medicines.**—In the early stages of pulmonary tuberculosis we may administer remedies according to either one of two sets of indications, as follows: 1. The constitutional conditions present, including under this heading morbid states of other viscera than the lungs; and 2. Remedies having a symptomatic relationship to the chest. In the majority of cases, the chest symptoms are so in abeyance in the beginning that most of us are inclined to rely upon constitutional remedies like *Arsenicum iod.*, *Arsenicum album*, *Calcarea phos.*, *Calcarea iod.*, and *Kali hyd.* Cough being the only symptom usually present, we may prescribe for this such remedies as *Aconite*, *Ferrum phos.*, *Bryonia*, *Phosphorus*, *Hepar*, *Drosera*, *Kali bichromicum*, *Ipecac*, *Spongia*, *Sanguinaria*, *Rumex* and *Iodine.*

The various preparations of *Iodine* undoubtedly enjoy the greatest professional confidence. The *Iodide of Arsenic* is given empirically by many physicians in the second decimal trituration, two tablets three or four times daily, and unquestionably gives very good results. Goodno* expresses his preference for the *Iodide of Antimony*, which he gives in three grain doses of the second decimal trituration repeated several times daily. He declares that it has a marked influenee upon the cough and profuse muco-purulent expectoration. The same authority speaks favorably of the *Iodide of Tin*, which "is nearly as valuable as the previous remedy, and, like Stannum, is pre-eminently indicated by profuse secretion rich in pus cells, consequently yellowish or greenish, sweet, homogeneous, usually easily expectorated."

*Ferrum phos.* is also an excellent remedy for the early stages, but is especially adapted to cases presenting blood-tinged sputum.

*Phosphorus* is the remedy for the very common class of cases, in which the peculiarities of the patient"s constitution are an important feature. He is a tall, rapidly-growing individual with highly sensitive nervous system, who catches cold easily; has frequent attacks of bronchitis. The chest symptoms are also prominent. Pains at the apices of the lungs, aphonia, oppression of the chest, especially at night, dry, hollow, spasmodic cough, and hæmoptysis are the local indications for this remedy.

*Spongia* is likewise indicated in the first stage. Its symptoms include hard, ringing cough, palpitations and sudden weakness while walking, severe dyspnœa on lying down, hoarseness, with sudden aphonia while speaking, whitish-yellow expectoration.

*Hepar Sulphur.*—Harsh, dry sounds in the chest without much expectoration. The patient is very sensitive to the open air, catches cold easily. Spasmodic cough in paroxysms with titillation of the larynx; habitual bronchial catarrhs with loud rattling of mucus.

*Calcarea phos.* is indicated in incipient cases occurring in anæmic pa-

* *Practice of Medicine*, vol. i, p. 386.

tients, especially if troubled with profuse sweat about the head and neck. It is also useful in the late stages of the disease when destruction of lung tissue has taken place. The patient complains of cough with soreness and dryness in the throat, stitches in the chest, purulent, greenish expectoration, hæmoptysis, rapid breathing, great emaciation, prostration, diarrhœa and flatulence.

*Calcarea carb.* is used only on its constitutional indications.

In the later stage of tuberculosis, the remedies commonly indicated include *Baptisia, Silicea, Stannum, Balsam of Peru, Yerba Santa, Arsenicum, Cinchona, Guaiacum, Arsenicum nat., Aurum ars., Chininum arsenicosum, Digitalis, Natrum sulph., Petroleum, Phellandrium.*

*Baptisia* is useful in cases presenting the septic type of fever with well-defined chills and sweats. The patient is very weak; great dyspnœa; profuse, purulent expectoration; loss of appetite; laryngeal involvement.

*Silicea.*—This remedy is indicated when there is extensive breaking down of lung structure, as indicated by the physical signs and profuse discharge of fœtid pus. The cough is associated with tickling in the suprasternal fossa, and is provoked by cold drinks and relieved by inhalation of moist warm air; night sweats; pulmonary tuberculosis of old people.

*Stannum* is useful in all stages of tuberculosis. There is a profuse mucus expectoration; dry, short, hacking cough; greenish or yellowish sputum, especially mornings; feeling of weakness of the chest after expectorating or talking; constriction of chest; chilliness with fever, especially in the morning; profuse night sweats.

*Balsam of Peru.*—Cases of tuberculosis with cavities attended by profuse expectoration of fœtid pus; septic type of fever; debility; feeble circulation.

*Yerba Santa.*—Asthmatic breathing with profuse accumulation of mucus; emaciation; fever; great intolerance of food.

*Arsenicum Album.*—This remedy is indicated by its general symptoms of asthenia and tissue destruction, and sepsis.

*Arsenicum Nat.*—Last stages of pulmonary tuberculosis; cavernous respiration; septic fever, but night sweats not well marked; extreme emaciation; frequent weak pulse; great dyspnœa; cough with copious green purulent sputum.

*China.*—This remedy is useful for the exhaustion of the late stages. Expectoration of bloody mucus; exhausting night sweats, especially on forehead, chest and back, especially when the patient drops off to sleep.

*Guaiacum.*—Pains in the left apex, with fœtid muco-purulent sputum; pulse soft, small and frequent; exhaustion and emaciation; offensive night sweats; skin hot, especially on hands.

*Aurum Arsenicos.*—Last stages of tuberculosis with rapid emaciation and debility (Hale).

*Chininum Arsenicosum.*—Great prostration, followed by cold, by deep sleep, after dyspnœa; awakens exhausted and bathed in sweat all over; limbs icy cold; anxiety, with dyspnœa and unquenchable thirst.

*Digitalis* is useful in the final stages as a palliative; irregular respiration; distressing dyspnœa; fear of suffocation at night with desire for fresh air; tenacious mucus in throat hard to detach; weak, dilated heart. *Digitalis* was recommended by Hartman when there is great excitement of the vascular system; expectoration is streaked with blood; lancinating pains about the præcordial region; palpitation with constriction about the chest.

*Natrum Sulph.*—Pulmonary tuberculosis of old people; sensation of goneness in the chest; soreness of the chest relieved by pressure, hence patient holds his chest while coughing; piercing pains in left chest; dyspnœa during damp weather.

*Laurocerasus* has been recommended by Hartlaub and Trinks, who claim to have cured with it a case of acute phthisis with incessant cough and expectoration of copious gelatinous mucus with blood. Gross has reported a similar result.

*Petroleum.*—Involvement of the larynx; pressing, digging pain in the chest; dry and hacking cough; cold air causes an oppressive feeling in the chest; pulse quickened by slight motion; cold feeling about the heart.

*Phellandrium Aquaticum.*—Cavity of lungs; expectoration very offensive; continuous cough, profuse sweat, diarrhœa, vomiting of food, excessive prostration and emaciation.

**Treatment of Special Symptoms.—Cough.**—The cough of pulmonary tuberculosis should never be treated in empirical fashion by palliative medication, but each case should be carefully investigated, and the conditions giving rise to the cough determined. Cough is very frequently relieved by some hygienic expedient, as maintenance of good ventilation of the sick-room, the avoidance of over-exertion, the taking of hot food, slow eating, limitation in the amount of food taken at a time, attention to local conditions of the pharynx, and pure nervousness.

In the early stage of tuberculosis, *Terpin*, in doses of three grains every two hours, is a most excellent remedy.

Pure Terebene, in doses of from one to five drops, is not only indicated for the dry winter cough of the early stages, but is capable of giving great relief and aiding expectoration and lessening production of secretions in the late stages, especially of the so-called fibroid tuberculosis.

As a pure palliative to suppress a dry tickling cough, there are no remedies equal to *Heroin* and *Codeia*.

Jousset * offers the following therapeutic suggestions: *Hyoscyamus*, for incessant cough at night, forcing the patient to sit up in bed, with vomiting or efforts at vomiting; the cough is excited by tickling in the trachea.

* *L'Art Medical*, November, 1891.

*Conium.*—Indicated under almost the same circumstances as Hyoscyamus; but the tickling is often substernal.

*Laurocerasus* in frequent cough. Usually the sixth dilution is the most efficacious, both for this drug and Hyoscyamus, but there are cases where larger doses should be used.

*Opium* and its preparations are very precious remedies in large doses for the relief of the cough; but they should be used only in hopeless cases, and as a palliative to calm the last moments of the poor sufferer.

**Dyspnœa.**—When this is very marked, *Ipecac* and *Carbo veg.* are both valuable remedies. Ipecac is indicated when the dyspnœa is sibilant, with difficult breathing. It should be used in the 1x trituration, 25 centigrammes in 200 grammes of water, a spoonful every hour.

*Carbo veg.* is indicated when dyspnœa is associated with a feeling of constriction in the chest.

**Fever.**—In the majority of cases, absolute rest in bed is sufficient to control the fever in the course of two or three weeks; at the same time, the open-air treatment should be rigidly enforced. If the high temperature proves resistant to rest, then sponging and other hydriatric measures may be ordered as in other fevers, but it must be remembered that the results are by no means as good in tubercular cases. *Baptisia* or *Echinacea* should be prescribed internally, if there is warrant for medication. In several cases, it has seemed to me that the patient's general condition was greatly improved by the administration of *Antifebrin* in doses of five grains about one hour before the time for the usual appearance of the fever. All of these cases were treated prior to the time when the value of the open-air sanitorium treatment was recognized as the ideal. The painting of the chest with ten minims of Guaiacol may also be mentioned as a means of lowering the temperature without producing any systemic disturbance.

**Night Sweats.**—These constitute a great annoyance to the advanced case of tuberculosis. Not infrequently, the measures already recommended for relief of the fever is sufficient to stop them. In other cases, we may employ as palliatives *Sulphonal*, *Atropia*, *Agaricine*, *Camphoric acid*, and *Picrotoxin.* Babcock claims to have had good results from simple sponging of the skin with vinegar and water, 1:6, or of quinine in dilute alcohol, one drachm to the pint. I have used *Sulphonal* in doses of seven grains every other night with very satisfactory results in several cases. *Camphoric acid* should be used in 15 grain doses three times daily; *Picrotoxin* in doses of $\frac{1}{80}$ of a grain every two hours; *Atropia*, $\frac{1}{100}$ of a grain just before retiring; *Agaricine* $\frac{1}{12}$ to $\frac{1}{6}$ of a grain each evening.

Jousset * offers the following special therapeutic hints:

*Phosphoric acid* will relieve this symptom when it becomes excessive; it will also meet the colliquative diarrhœa.

* *L'Art Medical*, November, 1891.

*Sambucus* also has great power in moderating the sweats, especially those occurring at night.

*Jaborandi* produces sweats. Jousset says he has used it successfully in phthisical cases in the first trituration.

**Diarrhœa.**—The disposition to look upon the diarrhœa of the late stages of pulmonary tuberculosis as a special clinical entity is unfortunate, as it interferes with the proper treatment of the condition. Of course, when dependent upon tuberculous ulceration the prognosis is well-nigh hopeless, but this is not the case in the majority of instances. The diarrhœa of tuberculosis should be treated as any other diarrhœa, *i. e.*, on symptomatic indications and special diet. The remedies which will prove to be of the most value include *Ferrum, Arsenicum, Cuprum arsenicosum, Ferrum phos., Cinchona,* and *Phosphoric acid.* Jousset recommends *Arsenicum* and *Phosphoric acid* as the most frequently indicated remedies. Should these fail he suggests *Cotoin* 1x or *Rhubarb θ* as of probable utility.

Cases refusing to yield to ordinary medicinal measures may be treated by daily irrigation of the large intestine with normal salt solution. The addition of antiseptic drugs, though often employed, is irrational practice and useless as to results The newer astringent preparations, as *Tannigen* and *Tanalbin,* are sometimes efficacious. The administration of *Opium* in physiological doses to check the diarrhœa by diminishing peristalsis may, indeed often does, work a symptomatic relief; but its ultimate effect is harmful, as it leads to the retention in the intestinal canal of substances that are better expelled.

**Indigestion.**—A very large proportion of the cases of pulmonary tuberculosis are the victims of what we might call, generally, "weak stomachs." Their poor appetites and enfeebled digestive powers stand as veritable Chinese walls against therapeutic progress. No case can hope to recover until the digestive power is increased. This question of increasing the digestive capacity of the tuberculous has already been considered under "Diet" (*vide*, p. 188); the only additional information necessary to its management may be obtained from the sections devoted to the treatment of digestive disorders.

**Hæmoptysis** will have its treatment fully described in the sections on the treatment of diseases of the respiratory apparatus.

**Chest pains** of tuberculosis are due to pleuritic involvement and myalgia or muscle strain from coughing. The remedies which will be found most efficient in their treatment are *Bryonia, Ranunculus, Aconite, Gelsemium, Kali carb.,* and *Scillitin.* When resistant to remedies, the well-known Belladonna plaster may be tried. If it does no good from a medicinal standpoint, the support given the chest by the plaster makes the patient feel easier. Guaiacol, painted over the seat of pain, sometimes gives great relief.

**Special Methods of Treatment of Pulmonary Tuberculosis.**—From time immemorial we have been blessed (?) with therapeutic discoveries destined to make the cure of pulmonary tuberculosis mere child's play. Some of them, and mostly those that deserved the least prominence, passed into well-deserved oblivion. Looking backwards, it seems incredible that any intelligent physicians should ever have considered seriously such therapeutic absurdities as the Bergeron Hydrogen sulphide treatment; and yet this created a great furor in its day.

But there have been other methods of treatment which created less enthusiasm, which were fashionable to a limited extent, and have been neglected. Some of these are worthy of continued attention because possessed of some merit, though not universal panaceas.

One of these empirical systems was used by me in the treatment of a case a number of years ago. The formula was published in the *New York Medical Journal* by a Binghamton physician, and was as follows:

| | |
|---|---|
| Iodine, | gr. $\frac{1}{2}$. |
| Bromine, | gr. $\frac{1}{4}$. |
| Phosphorus, | gr. $\frac{1}{100}$ |
| Thymol, | gr. $\frac{2}{3}$. |
| Menthol, | gr. $\frac{1}{6}$. |
| Sterilized olive oil, | ʒj. |

Of this mixture, 30 minims are to be injected hypodermically each day beneath the skin between the scapula. No other treatment was tried in this case. The patient laid on flesh, and to-day is as healthy a looking specimen as one would wish to see. This treatment was tried in this case because it was utterly impossible to enforce any rules as to hygiene, etc. Having full faith in the efficacy of Iodine, Bromine and Phosphorus, I gave the injection a trial. Other patients have declined to either use the injections themselves or to take the time to report daily for the same.

Other injection treatments for tuberculosis have been recommended, including the the use of *Thiocol*, the *Cacodylates*, etc., but I have had no experience with them. The reports concerning them are by no means satisfactory.

**Inhalations.**—It is very doubtful if the inhalation of various drugs has any efficacy in the treatment of tuberculosis. But the practice does appeal to patients and makes them more manageable. Probably the most convenient is Creosote, administered in a Robinson respirator. The formula for the inhalant should consist of equal parts of pure beechwood Creosote, Alcohol, and Chloroform, of which sufficient is dropped on the sponge in the bottom of the mask to give the patient about one minim of the mixture by inhalation every minute. At first, the seances should be of 20 minutes' duration, and repeated three times daily. Their duration may be increased, until at the end of a week the patient is inhaling for one hour three times daily.

Too much dependence must not be placed upon this treatment. It is certainly not curative when administered as the sole treatment. There is a general impression that it is of some value when used in conjunction with the plans of treatment already recommended. Our faith in its efficiency is not as great as it was five or ten years ago. The same may also be said of inhalation treatments by various complicated apparatus which can be used in the physician's office only. However efficient various antiseptics may be in destroying the bacilli in the laboratory, they are almost valueless when given by inhalation of vapors or sprays.

**Tuberculin Treatment.**—When the tuberculin treatment of Koch was first announced it was carried to extremes, and in consequence fell into disrepute. More recent clinical observations seem to show that when used in small quantities, and with great caution, it is of considerable value. The best method of using the old Tuberculin is as follows: The patient's temperature is carefully studied over a period of several days to make certain that fever is absent. The initial dose of the drug should always be small, 0.1 mg. being considered the proper quantity for weak patients. Larger doses, even to 1 mg., may be given to those in whom the tubercular changes are but slight. In case of doubt as to the dose, the smaller quantity should always be selected. It should always be our object not to give sufficient the first time to produce a reaction. If we succeed in this, we may double the quantity when the Tuberculin is administered the second time. If, however, there ensues the slightest fever, the dose should remain as at first. The so-called reaction is manifested by headache, malaise, fever, pains in the extremities, cough, and moderate dyspnœa, all within four or five hours. A temperature increase of 1° F. should always be regarded as a reaction. By care in increasing the doses of Tuberculin, it is possible to carry on the treatment without producing any reaction. The course of treatment should cover three to six months.

If small quantities of the old Tuberculin produce too great reaction, we should start the treatment with Koch's TR., which should be administered in initial doses of .001 mgr. Later, it may be increased by gradual steps until 0.1 mgr. is taken. The treatment with TR. may be followed by the administration of the old Tuberculin.

The Tuberculin treatment stands in high favor among those who have used it extensively; but it is to be noted that no one depends upon it to the exclusion of other more generally recognized procedures.

Attempts at carrying this treatment out by administering the Tuberculin by the mouth have not proven satisfactory.

There is a growing conviction that we will ere long be able to produce an immunity against tuberculosis. Already laboratory experiments have demonstrated our ability to secure this result in certain of the lower animals. We cannot be said to have attained any success in immunizing human beings.

## Leprosy.

Leprosy being an incurable disease so far as the measures at present at our command are concerned, the most important treatment is the prophylactic. That the disease is contagious and is spread by transmission from the afflicted to the healthy is universally admitted. But the manner in which infection takes place is absolutely unknown. I believe I am safe in saying that it is not even surmised. We have reason to believe, however, that an intimate association with lepers is required before one can contract the disease. The utter helplessness of the medical profession in assigning an exact explanation as to the propagation of leprosy is shown by the great differences in views as to its etiology at different periods. Thus, in 1885, the Royal College of Physicians declared that "leprosy is not contagious." In 1887 they modified their views by admitting that many eminent authorities were not in accord with the resolution formerly expressed. Daniellson made several experiments, about twenty in all, to determine the possibility of transmitting leprosy by inoculation. In each instance the result was negative. Others in experimenting have obtained positive results, but, it has been claimed, without excluding the possibility of the disease having been derived from other sources than inoculation.

In face of the failure to obtain transmission of the disease by inoculation, we have in literature numerous instances in which the close association of the healthy with the leprous has resulted positively. On the other hand, numerous persons living in prolonged contact with lepers have remained healthy.

In spite of all the contradictory teachings respecting the communicability of leprosy, we must still continue to believe that it is contagious. Inconsistencies on the part of those who contend for the non-contagiousness of the disease are readily demonstrated.

Admitting then that leprosy is a communicable disease, the prevention of its spread becomes an important matter. Undoubtedly, segregation of lepers becomes an important prophylactic measure. If it were possible to secure every victim of the disease in a hospital or asylum there can be no doubt of our ability to eradicate the disease. Unfortunately, strict enforcement of isolation of all lepers must lead necessarily to many cases—probably the majority—being kept in hiding; and these are just the ones that are likely to do the most damage in disseminating the disease. From what we know of the etiology of leprosy, it is reasonable to suppose that a watchful supervision over lepers will be far more productive of results than will a rigidly enforced segregation of all persons suffering from that complaint. When the victim belongs to a social class able to give him every hygienic attention, and the patient is sufficiently intelligent to observe proper precautions, there is no good reason why he should be subjected to the im-

prisonment and discomforts of segregation for the balance of his life. On the other hand, cases occurring among persons living in crowded quarters and amidst filth and squalor, the safety of the community—and even their own comfort and happiness—will be served if they are confined in proper asylums. As to the conduct of such institutions this article has nothing to do, beyond saying that life within their walls can be made comfortable if the health authorities are so disposed.

Lepers permitted to remain at large in a community should be compelled to have their own eating utensils and bed-clothing and bedding, which should under no circumstances be used by any one else. The greatest care should be taken of their laundry and towels. With these precautions, it seems to the writer that they cannot be dangerous to others.

When patients are forced to enter leper asylums or colonies, the propriety of permitting other members of the family going with them may be considered. There seems to be no legitimate reason why husbands should not be permitted to accompany wives, and wives, husbands. Children, on the other hand, should be carefully excluded from the privilege.

Of the treatment of leprosy very little can be said. Remedies are many; favorable results, wanting. It is true that some cures and many alleviations have been reported; but practically none of these bear careful analysis. It must be remembered that leprosy does not pursue a steady progressive course. On the contrary, it is the rule for the patient to undergo periodical improvement and relapses. It has also been observed that lepers coming to this country from foreign parts have improved under the good hygienic conditions prevailing on this side of the water. Climate likewise plays an important part in such improvement.

Of remedies that have been recommended, *Chaulmoogra oil* enjoys the best reputation. It is given in doses ranging from 5 to 80 drops three times daily. Some have claimed that even better results are obtained from such extravagant doses as three hundred minims daily. The drug is highly irritant to some stomachs, and hence must be administered with care. It is prescribed in the form of emulsion or in capsules. Its best results have been obtained in tubercular cases. Chaulmoogra oil has also been used externally, one part being mixed with five to fifteen parts of olive oil or cocoanut oil. When Chaulmoogra oil cannot be made to agree with the patient, its active principle, *Gynocardic acid* in the form of Gynocardate of Magnesia or Sodium may be administered in the form of capsules, each of which is to contain 20 to 30 cgm., the patient taking from 10 to 30 of these daily.

*Gurgun oil* owes its reputation to the advocacy of East Indian authorities. It is usually administered in the form of an emulsion with equal parts of lime water, the dose of which is from one to four drachms. It may also be applied externally by inunction, the unguent consisting of one part of Gurgun oil to three parts of lime water or olive oil.

*Hoang-Nan* is much used in China. Many reports have been made tending to prove the ability of this drug to alleviate the symptoms of leprosy. It should be used with care, as excessive dosing with it is capable of producing tetanoid spasms. It is believed that the good results from Hoang-nan are largely due to the Strychnia which it contains,

*Ichthyol* owes its reputation to the report of two cures made by Unna, who administered this drug internally, while externally he applied reducing agents, such as Chrysarobin, Resorcin, Pyrogallol, and Salicylic acid.

In certain countries, lepers have caused themselves to be bitten by venomous serpents in the belief that the venom of these reptiles is curative. Certain it is, that in many instances the lesions have disappeared or been greatly modified by the treatment. This practice has led to the treatment of leprosy by Calmette's Antivenene. In four out of five cases thus treated by Dyer, of New Orleans, the results were most excellent.

Homœopathic experience with the treatment of leprosy is sadly wanting. So deficient is our literature in this respect that nothing can be said on the subject up to the present time.

## Malta Fever.

(***Mediterranean fever; rock fever; Neapolitan fever; Danubian fever.***)

The mortality presented by Malta fever is low, being generally estimated at about 2 per cent. The disease, however, is not without its dangers, which include hyperpyrexia, pneumonia, endocarditis, and profound anæmia leading to fatal syncope.

The general plan of treating the disease is that involved in the management of typhoid fever. We do not have to fear, as in the latter affection, the possibilities of intestinal hæmorrhages, intestinal perforation, or the severe general toxæmia. As with typhoid fever, we must institute measures to maintain the patient's strength, but are able to do the latter because of the absence of intestinal lesions.

In the majority of cases, the fever being but moderate, requires a mild, cooling measure like cold sponging of the body. If hyperpyrexia should ensue the cold bath, at a temperature of 68 ° F., becomes necessary. The patient should be kept in the bath about ten minutes unless he exhibits well-defined weakness, in which case it should be continued but five minutes. Repetitions of the bath should be made whenever the temperature rises to 103 ° F. or over. Immediately following the bathing, the patient should be wrapped in a dry sheet or light blanket and put to bed. If, during the bath, the patient is chilled or the pulse weakens, brandy or whisky should be administered as a stimulant, and hot bottles applied to the feet.

Vomiting is at times a prominent feature of the disease, and is best treated by small pieces of ice. If it persists despite this Morphia will check it.

The diarrhœa is best controlled by dietetic measures. The indicated remedies for this symptom include *Arsenicum*, *Rhus*, *Cinchona*, and *Tannigen*.

To relieve the constipation, enemata constitute the best remedy.

If a purge should be required, Calomel will be the most satisfactory.

The generalized pain and aching are best met by *Bryonia* and *Gelsemium*. If a palliative is demanded, *Acetanilid* or *Antipyrin* may be given, but the effect on the heart, if any, should be carefully watched. These medicines do not seem to have the depressing effect observed in cases of typhoid fever. Still, they should not be administered recklessly.

If the joints become swollen and inflamed they must be wrapped in cotton or wool, as in arthritic fever. *Bryonia*, *Rhus*, and *Colchicine* are the best remedies.

During the active febrile stage the patient should be kept on a liquid diet, including milk, broths thickened with barley, with or without the addition of an egg, gruels, and bouillon. It should be given at short intervals. In some cases, semi-solid food agrees better than does that of a liquid character. With the acute stage of the disease over, the dietary may be enlarged, rice and custard puddings, fish and white meats being permissible. From this time on there should be a gradual enlargement of the diet list, until at the end of two weeks after the temperature has attained the normal the ordinary diet is resumed.

Experience has taught that complete restoration does not take place until the patient has made a change of climate.

# CHAPTER II.

## THE CONSTITUTIONAL DISEASES.

### Obesity.

WERE patients possessed of ordinary reasoning powers the treatment of obesity would prove to be remarkably successful. Unfortunately, the self-same factors that bring about undue deposits of adipose are the very ones that interfere with the well-directed measures looking to relief. Physicians themselves are also to blame for the failure in many cases, for, as a rule, we find them wedded arbitrarily to some one particular plan to the exclusion of others, and persistently refuse to individualize their cases.

Before determining that an obese patient shall undergo a reduction treatment, it is necessary to decide whether or not such a treatment is necessary or even advisable. It is, however, a good general rule to regard obesity as a serious complaint, not so much of itself as because of the complaints that follow in its wake. Insurance companies recognize this fact by declaring uninsurable certain parties who are more than a given amount over the standard weight.

Before starting out on a course of reduction treatment, one must determine first of all the possibilities of the case. The hereditary tendency of the patient to obesity must be considered. This, of course, cannot be remedied. Stout the patient will remain, in spite of any efforts we may make. We can, however, bring the weight down within reasonable limits, and keep it there, providing we have the co-operation of the patient.

The habits of the patient bear a close relationship to his temperament. They are, therefore, overcome with the greatest difficulty. Stout persons are too often of an easy-going, lazy disposition. They take such little exercise that they are incapable of oxydizing even less than the normal quantity of food. Sometimes this temperament is the result of the obesity; in other cases it is the cause. This relationship of cause and effect must be carefully determined before treatment is instituted.

In the vast majority of cases of obesity one finds that the condition relates more particularly to the patient's habits as to food, drink, and exercise. It is really astonishing to note the high nutritive value of the food taken by some lovers of table pleasures. If such over-eating is combined with regular indulgence in alcohol the result is all the more disastrous. But we cannot dogmatize respecting food and drink, for we find some thin and spare individuals who regularly partake of quantities of food that can

be declared truly enormous, while, on the other hand, there are very stout subjects who, to use a colloquialism, do not eat enough to keep a nightingale alive.

All this teaches us that we must individualize our cases of obesity if we would be successful.

Again, we must remember that obesity may be a purely relative term, that is to say, the patient may not be stout or obese according to current ideas, and yet he has taken on more fat than is good for his health or life expectancy. Such cases are recognizable by the physician alone. He may advise the patient of the necessity of reducing weight because of the association of functional disturbance of the liver, heart, lungs, etc., and the association with rheumatic affections of the joints and muscles. Such advice is often unwise from the standpoint of self, for vanity rules in all things. A woman may be very well pleased with her *embonpoint*, and it not uncommonly jars her very much to be told of the necessity or advisability of getting rid of it. Diplomacy is required always in advising such patients, lest they take offence and seek the counsel of other physicians less conscientious and more tactful (?).

*What cases of obesity are fit subjects for treatment?* To this question we may answer practically all; the only exceptions we would make are those who have been unduly stout for many years, or who are of such an advanced age as to make success impossible. To this list we might also add those who have, in association with the obesity, serious organic diseases of various viscera. This last class need not be regarded as hopeless, for with them we may, by exercising due care, obtain results that in the beginning were entirely unexpected.

The general fault in the treatment of obesity lies, as already stated, in the adherence of physicians to some pet system, good in itself for individual cases but by no means valuable even in a majority of the afflicted. That failure must follow such a routine practice is evident to any one who has any knowledge of the complex factors at work in the production of obesity.

The best results in the treatment of obesity are obtained in cases of medium grade. The accumulation of fat has not thus far been sufficient to disturb the functional activity or structural integrity of any of the organs, though it may do so if sufficient time has been permitted to elapse. The only barrier to success in their treatment lies in the unwillingness of patients to give up the good things of the table, and to take care of themselves according to the rule laid down by their medical adviser.

For therapeutic purposes, cases of obesity may be divided into two classes. In the first, which is practically always amenable to treatment, investigation discovers that the patient partakes of more food than is necessary for the maintenance of nutrition and neglects exercise. He may, moreover, be inclined to indulge regularly in alcoholic beverages, not necessarily

to what is commonly known as excess. We may be told by themselves and families that they are not excessive eaters, and yet when a list of the articles and the quantity of the same consumed each day is made we find that instead of the fuel value of the food being 2,750 calories daily, as ordinarily estimated to be the proper quantity, it may amount to 3,500 or 4,000 calories. We find also that such patients are taking excessive quantities of liquids, and indulge themselves in but little exercise. A good general rule to govern the treatment of all of these cases is the limitation of the quantity of food so that they shall, for a time, take a quantity equal to about 1,700 calories daily, and systematic gymnastic training. In addition, they should be instructed to limit themselves to such articles of diet as are the least likely to lead to the laying on of fat, the starches and sugars being generally regarded as the most pernicious in this direction. Making our systematic study of these patients, we should determine the kind of foods for which they have hitherto exhibited a decided preference, and *unless their tastes are unquestionably pernicious*, the dietetic articles to be eliminated should be those for which the patient has had but little liking. With these preliminary remarks, I am now ready to present the various dietetic systems that have been advocated for the cure of obesity.

**The Banting System.**—This system derived its name from a Mr. Banting, who, in 1862, was treated for obesity by Dr. W. Harvey. Briefly, it consists in reducing the daily quantity of food and restricting the amount of sugars and starches taken to the utmost, and, when possible, eliminating them altogether from the diet. The quantity of fluids taken was limited to 35 ounces in the twenty-four hours. The patient partook rather freely of animal food, but the quantity of bread, butter, milk, sugar, potatoes, and sweet wines was limited if not entirely eliminated. Under this regimen, Banting lost 46 pounds in one year, and although he was 66 years of age this was accomplishod without discomfort. Further trial of the "system" which had thus gained a great reputation goes to show, to use the words of Dyce Duckworth, that Bantingism is both unphysiological and impracticable. The large quantity of nitrogenous food consumed leads to indigestion and malassimilation; mental depression and various nervous phenomena follow. Experience has demonstrated the necessity of a certain amount of fatty and starchy food to secure good nutrition. The "Banting system" has, therefore, been very properly abandoned as a routine system of treatment, though it may, in exceptional cases, be proven of value.

Vogel has modified the Banting system by prescribing the following dietary routine; *Early breakfast:* Coffee, minus sugar and milk; toasted bread or zweiback, without butter. *Late breakfast:* Two boiled eggs, lean meat or ham, taken raw, with a cup of tea. *Dinner:* Plate of weak soup, cooked lean meat, potatoes moderately, a small amount of bread, and green vegetables freely. *Supper:* Bouillon or tea, cold lean meat in some form, little bread, soft-boiled eggs, salad.

**Weir-Mitchell's Method.**—This consists in keeping the patient in bed, and on a diet exclusively of skimmed milk. The absence of exercise is atoned for by daily systematic massage or Swedish movements at the hands of a competent manipulator. Under this treatment the patient loses from one-half to one pound daily. As a rule, it is wise not to break too suddenly upon the exclusive milk diet, but gradually eliminate from the diet one article after another until at the end of one week the patient is taking skimmed milk exclusively. In pursuing this plan of treatment it is of the highest importance that the patient be thoroughly examined day after day, special attention being paid to the condition of the heart and blood-pressure. Should unfavorable symptoms arise, the diet must be extended by the addition of solid food and the administration of stimulants. To relieve the monotony of an exclusive skimmed milk diet, small quantities of beef, chicken, or oyster soup may be permitted. The patient is kept at absolute rest in bed for two weeks, after which she is permitted to rest on a couch; after another week she may move gently about the room. The whole course of treatment requires from four to six weeks. Then the diet is gradually increased by adding one article after another to the dietary until the patient is once more on full diet.

A reducing system like this would have a bad influence on the strength of the patient were it not for the fact that she is kept at absolute rest in bed. The great objection urged against it is the expense incurred, and the necessity of forcing the patient to abandon all other occupations.

**The Ebstein System.**—This system permits the use of fats; indeed, according to Ebstein, they are to be recommended in that their use promotes a sense of satiety, and thus lessens the craving for other food and drink. Sugar, potatoes, and all farinaceous food with the exception of three ounces of bread daily. The fats permitted include: fat meat, cream, butter, and fatty soups; the vegetables: asparagus, spinach, cabbage, peas and beans; the fluids are restricted. The following is a sample dietary:

*Breakfast:* A cup of black tea without sugar or milk; two ounces of buttered toast. *Dinner:* A meat soup or broth; four to six ounces of boiled beef or roasted fat beef with meat gravy, not thickened; one or two fresh vegetables in moderation; for dessert, salads and fresh or dried fruits. A little light wine or black tea without milk or sugar may be allowed. *Supper:* Tea as before; a soft-cooked egg; a moderate allowance of fish, ham, or cold fat meat; one ounce of thin buttered bread or toast; and fresh fruit.

**The Oertel System.**—Oertel more than any other authority individualizes his cases. He lays great stress on the action of the heart at the time of beginning and during the course of the treatment. He makes the following general suggestions:

"(*a*). Where there is an abnormally increased amount of fat in plethoric patients with unimpaired or only beginning changes in the heart action, the diet should aim at—

"(1) An increased supply of protein.

"(2) A decrease in the fat-producing substances.

"(3) Little or no diminution in the supply of liquids below the physiologic amount (1,500 cc.—3 pints).

"(*b*). Where there is obesity in anæmic patients, viz., serous plethora, the diet should aim at—

"(1) An increase in the quantity of proteins.

"(2) A diminution in the amount of fat-forming substances, and eventually—

"(3) A decrease in the amount of fluid.

"(*c*). Where there is obesity in adults with hydræmic symptoms, in whom not only the amount of protein but also the abnormally increased amount of fat is slowly wasting away, they require—

"(1) An increase in the amount of protein taken.

"(2) A sufficient amount of fat and carbohydrates or even an increase of same to prevent the falling off of fat.

"(3) A diminution in the amount of fluid taken."

Throughout the course of the treatment the greatest care is taken in observing the condition of the circulation, as slight indiscretions, especially in the direction of excess, may cause such symptoms as oppression, palpitation of the heart, and difficult breathing. It is even possible that too hearty a meal may occasion sudden death from paralysis of the heart.

In cases in which the respiratory and circulatory systems have not been disturbed, and the general strength of the patient is such that a moderate amount of exercise may be taken without discomfort, a liberal amount of fat and carbohydrates may be permitted.

When, on the other hand, the blood is poor, there is advanced venous stasis, and muscular exertion interferes with respiration, the quantity of fats, carbohydrates, and fluids must be reduced to a minimum.

The idea of the treatment is to afford the patient the proper amount of nourishment without forming fat. To this end, the diet should be regulated according to the individual case. As a guide he gives the following figures:

| | Protein. Grammes. | Fat. Grammes. | Carbohydrates. Grammes. | Calories. |
|---|---|---|---|---|
| Minimum, . . . | 156 | 25 | 75 | 1,180 |
| Maximum, . . . | 170 | 45 | 120 | 1,608 |

Of importance is the regulation of the quantity of fluids taken. Ordinarily, 1,500 cc. is to be accepted as the physiologic limit, this amount being exceeded only in the case of unusually tall individuals or where there is fever, in which case 1,800 to 2,000 cc. may be prescribed.

Oertel advises that solid food be taken in several small meals. Should the patient be anæmic a good breakfast is of importance, but should not include either tea or coffee.

A standard *menu* of the Oertel system to be used as a foundation from which to construct a list for individual cases is the following:

*Morning.*—One cup of coffee or tea with a little milk—altogether about six ounces; bread, about three ounces.

*Noon.*—Three to four ounces of soup, seven to eight ounces of roast or boiled beef, veal, game, or not too fat poultry, salad or a light vegetable, a little fish (cooked without fat), if desired, one ounce of bread or farinaceous pudding (never more than three ounces), three to six ounces of fruit, fresh preferred. for dessert. Fluid should be avoided as far as possible. In hot weather, or in the absence of fruits, six to eight ounces of light wine may be taken.

*Afternoon.*—The same amount of coffee or tea as in the morning with at most six ounces of water, and an ounce of bread as an exceptional indulgence.

*Evening.*—One or two soft-boiled eggs, an ounce of bread, perhaps a small slice of cheese; salad and fruit, six to eight ounces of wine with four or five ounces of water.

After the proper amount of reduction of fat has been accomplished, Oertel offers the following diet list:

*Morning.*—One cup of coffee or tea with some milk (150 grammes), and bread, (75 grammes).

*Midday.*—Soup (100 grammes); lean meat, roasted or boiled, game or fowl (200 grammes); fish, not too fat (25 grammes); bread or starch-stuffs (100 grammes at most); as dessert, 100 to 200 grammes of fruit, fresh preferred. Liquids are better avoided. At dinner-time, only in hot weather and in absence of fruit, one-sixth to one-fourth litre of light wine.

*Afternoon.*—The same quantity of coffee or tea as before, with at most one-sixth litre of water; occasionally, 25 grammes of bread.

*Evening.*—One or two soft-boiled eggs; meat, (150 grammes); a bit of cheese, a little salad and fruit. As a regular drink, one-sixth to one-fourth litre of wine with perhaps one-eighth litre of water.

A very important feature of the Oertel system is the graduated exercises, sometimes known as the "Terrain cure." The exercise consists in "ascent climbing." The author divides his grades into four classes, of 5, 10, 15, and 20 degrees, respectively. Units of distance are established, and the patient, according to his condition, is instructed to begin with the easiest grade. When the condition of the heart is excellent, these exercises may be instituted at the beginning of the treatment. The patient may take as long as he likes to go over the prescribed distance; the only essential is that the work is accomplished. With improvement in his condition,

he may be advanced both as to distance traveled and grade climbed, promotion being given only when it has been determined positively that the patient is ready for it. The walking exercises should never be undertaken shortly after a full meal. Indeed, it is always well for the patient to rest for a short time after meals.

**The Schweninger System.**—The repute of the Schweninger system is based very largely upon the success obtained by that physician in the treatment of von Bismarck. It follows closely upon the lines laid down by Oertel, but differing from that system mainly in the entire prohibition of liquids at meals. No drinking is permitted until two hours have elapsed after eating. His diet list is as follows:

*Breakfast*, 8 A.M.—(To be preceded by exercise and a bath an hour before.) Meat, eggs, or milk. After this a walk.

*Lunch*, 10.30 A.M.—Meat or fish and a glass of white wine. To be followed by a walk.

*Dinner*, 1 P.M.—Meat, vegetables and fruit compote.

*Supper*, 7 P.M.—Meat and fruit compote or salad, and a glass of white wine.

Bread is to be taken as sparingly as possible.

**Treatment by Dry Diet.**—The Schweninger system has done much to popularize the treatment of obesity by drink restriction—a plan most excellent in its place, but not to be abused. Unquestionably, a very large proportion of stout individuals consume altogether too much fluids. Many of them perspire profusely, and demand large quantities of water to atone for the loss thus occasioned. The treatment by drink restriction demands that the patient be limited to 30 ounces of fluids daily. It may be carried out in conjunction with other systems when there are no contra-indications. It is especially applicable to cases presenting hydræmia, and weakness and dilatation of the heart. In such cases, it is often beneficial to administer Digitalis. Drink restriction is especially contra-indicated in cases of obesity attended by glycosuria, in which case it is advisable and even necessary to insist upon the administration of not less than three pints of fluid daily. Free drinking of water is also indicated in cases to which a rather large diet of proteids is prescribed, as in the Salisbury plan of treatment. In gouty individuals also water is essential as an eliminant, but so far as may be possible it should not be administered until three hours after meals. It is usually a good plan to give a half pint of water the last thing on retiring and again on rising in the morning. The free drinking of water in all of these cases is prescribed with the idea of promoting metabolism and increasing the discharge of urea.

The treatment of obesity by increased water-drinking is sometimes known as the Germain See method, that clinician contending that many corpulent persons suffer from gout or the so-called uric acid diathesis (?).

He therefore advises tea and coffee, taken as hot as possible in considerable quantities, especially at breakfast. He, however, prohibits alcoholic beverages with the exception of small quantities of white wine, which, however, must be diluted.

The subject of water-drinking brings to mind the Spa treatment of obesity. Of these it may be said that their beneficial influences depend not so much upon the particular kind of mineral water administered as the peculiar methods of living laid down by the physicians in charge of the spas, and the auxiliary therapeutic measures there enforced.

**Schleicher's Diet.**—*Breakfast*, 7 A.M.—A mutton or veal cutlet or a portion of sole as large as the palm of the hand; the same quantity of bread without butter.

8 A.M.—A cup of tea with sugar.

10.30 A.M.—A sandwich of bread and meat sausage.

*Noon.*—Meat, eggs, green vegetables, cheese, an orange. Two glasses of white wine. (No soup; no potatoes.)

4 P.M.—Tea with sugar.

7 P.M.—A small quantity of bread and cheese.

9 P.M.—Cold meat, eggs, salad. Two glasses of wine and sometimes more.

As remarked by Friedenwald and Rührah, this diet is "quite similar to that of Schweninger, except that the former does not insist on prohibiting fluids absolutely with the meals."

**The Salisbury Method.**—The diet according to this system consists mainly of meat and hot water. It is indicated in those cases of obesity which are associated with indigestion, especially if there is considerable gastric fermentation. For the purpose of thoroughly cleansing the stomach, the patient is directed to take a pint of hot water one hour and a half before each meal. If the hot water is objected to, it is made palatable by the addition of a small quantity of lemon juice or weak tea. The only food prescribed, in the beginning at least, is finely-chopped beef. This enables the stomach to perform the digestion without the necessity of first disintegrating the food. The maximum amount of meat permitted at a meal is one pound. In the beginning, it should be limited to one or two ounces, and the quantity gradually increased day by day until the maximum is taken. If the patient's appetite is not satisfied, and there is great craving, the patient may take small quantities of broth between meals. At the end of the treatment, when it is desirable to increase the diet list, the following articles may be permitted: Mutton, lamb, sweetbread, poultry, white fish, soft-boiled eggs, baked potato, well-boiled rice, macaroni, wheat bread. This diet is open to the objection of being tiresome, but most patients tolerate it very nicely after a short time.

**Hirschfeld's Diet.**—This is as follows:

*Breakfast.*—Two ounces of bread, and coffee without sugar or milk.

*Forenoon.*—Two eggs.

*Dinner.*—Soup, with two ounces of rice (weighed uncooked), eight ounces of lean meat boiled or roasted with a little fat.

*Afternoon.*—Black coffee.

*Supper.*—Two ounces of cream cheese, four ounces of bread, one-half ounce of butter:

**Von Noorden's Diet.**—8 A.M.—Three ounces of cold lean meat, one ounce of bread, a cup of tea or coffee with a spoonful of milk, but no sugar.

10 A.M.—One egg.

*Noon.*—A cup of strong soup without fat.

1 P.M.—A small plate of clear soup, five ounces of lean meat or fish, three and a half ounces of potatoes, green vegetables, three and a half ounces of fresh fruit.

3 P.M.—A cup of black coffee.

4 P.M.—Seven ounces of fresh fruit.

6 P.M.—A glass of skimmed milk.

8 P.M.—Four and a half ounces of cold lean meat with pickles, one ounce of Graham bread, two to three teaspoonfuls of fruit cooked with sugar.

When one comes to analyze the various diet systems in the treatment of obesity he will observe that they are all practically starvation systems, for they allow but about 1,500 calories daily, instead of the 2,750 usually required.

Thus:

Banting allows, 1,100 calories.

Oertel (maximum), 1,600 calories.

Oertel (minimum), 1,180 calories.

Ebstein, 1,300 calories.

Hirschfeld (maximum), 1,400 calories.

Hirschfeld (minimum), 1,000 calories.

Von Noorden, 1,366 calories.

**Ander's System.**—Anders, who has established quite a reputation in Philadelphia in the treatment of obesity,* speaks of his treatment as follows:

"Fat reduction must always be slowly progressive. If the case is one of plethoric obesity, a judicious arrangement of the food, *c. g.*, a moderate increase of the proteid substances and a corresponding diminution of the carbohydrates, is indicated. Muscular exercise, so far as possible in the open air, must also be enjoined—walking, horseback riding, bicycling,

* Osler's *Modern Medicine*, vol. i, p. 859.

rowing, swimming. These measures usually accomplish a successful reduction even in well-established examples of the condition. The majority belong to this type, and the writer (Anders) is in the habit of ordering the following dietary with modifications to suit the peculiarities of individual cases:

"*Morning Meal.*—Fruit, as an orange or two peaches, or one-half a grape fruit (without sugar), or a sour apple, fine wheat bread, 1¼ ounces (grm. 40); a soft-boiled egg; milk, 1 ounce (28 cc.); saccharin, ½ grain (grm. 0.03); coffee, 4¼ ounces (120 cc.).

*Noon Meal or Luncheon.*—Caviare, 2 drachms (grm. 8); lamb-chops, sweatbread, boiled ham (cold), or fowl or game in season, 3 to 4 ounces (grm. 90 to 120); salad, 1 ounce (grm. 30); (with a small amount of French dressing); cheese, 1 drachm (grm. 4); bread, rye or bran, ½ ounce (grm. 15); fruit (excepting strawberries and bananas) or, instead of the latter, water, 4 ounces (125 cc,).

*Evening Meal or Dinner.*—Soup (clear) 3 ounces (85 cc.); fish 2 ounces (grm. 60); roast or broiled beef, lamb, veal, game, or poultry, 4 to 5 ounces (grm. 125 to 150); one or two of the following green vegetables: Spinach, string beans, green peas, celery (stewed), asparagus, raw sliced tomatoes, Brussels sprouts, 1½ ounces (grm. 42). For dessert, may take plain rice pudding, junket, cup custards (all sweetened with saccharin) or fruit (except strawberries and bananas) either raw or cooked, 4 to 5 ounces (grm. 125 to 150). May take 4 to 5 ounces (125 to 150 cc.) of water when fruit is not used.

"No fluid is to be taken at meals except as indicated above, but a glass of water on rising and three hours after food is permitted. During the warm season, particularly if the sweat glands are active, an additional glass of water may be occasionally allowed."

After this review, no words of caution from me are required respecting the necessary care in carrying out the necessary directions. As a rule, it is wise after accomplishing some result to suspend the treatment for a time.

In many instances in which there is plenty of time to carry out the treatment, and the patient must go about his or her usual duties, it is the best plan to limit the diet so that the heat value of the food taken amounts to about 2,500 calories daily. When the more rigid systems are followed it is, as a rule, essential that the patient devote the entire time to the treatment to the neglect of the ordinary duties of life.

In arranging a diet list for the obese, the greatest difficully is encountered with bread. It is a necessary food, and yet is fattening when taken at all immoderately. When convenient, the patient should be directed to take the coarser varieties of bread, because they contain more waste. It is a good plan also not to vary the diet too much, as patients will consume less than they otherwise would. Condiments should be forbidden, as they stimulate the appetite.

## Diabetes Mellitus.

It is unfortunate that the current idea as to the treatment of diabetes mellitus centres in the administration of food that will entirely eliminate the excretion of sugar by the urine. In other words, physicians are in the habit of resting satisfied with placing their diabetic patients on an anti-diabetic diet, following routine procedures. If the case does well, as many of them do, it is regarded as a confirmation of the correctness of their therapeutic views. If failure results, and the case goes from bad to worse, little or nothing more is done, and all interest in the welfare of the patient is lost. As a matter of fact, there is no class of patients for whom more can be done by close supervision of the treatment than is possible in the case of diabetics. Success demands, however, that the cases be carefully studied and individualized. The plan of action that proves invaluable in one patient will turn out to be calamitous in another. Such apparent inconsistencies have led many physicians who are reasonable in other things to decry dietetic precautions in diabetes; still others have permitted themselves to fall into the unfortunate mental state of therapeutic nihilism.

While the treatment of diabetes centres about the framing of a proper diet, other measures, including the administration of medicines, are not without great value. Indeed, the practice of resting satisfied with giving directions as to diet is to be condemned. A recent author has truly remarked that a lazy man should not undertake the management of a diabetic. With this I am satisfied that my reader will agree if he but studies the entire situation.

The general management of the patient as to habits of living must be regarded as of the highest importance. The majority of diabetic patients present a strong neurotic taint, which in turn is aggravated by their disease. Hence, we should eliminate from the daily life, as far as possible, such influences as are calculated to produce nerve wear and tear, as worry, excessive mental labor, etc. Respiratory diseases constituting important complications, it is essential that the patient be properly clad. Flannel or silk undergarments should be worn next to the skin. The latter should be carefully attended to by daily lukewarm baths. When the patient's general health is good, the morning cold bath followed by brisk friction is to be advised. As a rule, no instructions as to change of climate need be given. If, however, the locality in which the patient resides is found to disagree, then a change is imperative. Exercise and fresh air are universally admitted to be important adjuvants, and conditions must be regulated so that the patient shall have them. The amount of exercise must be regulated by the patient's strength and nutrition. Given a person who is gaining in weight, and is muscularly strong, few or no restrictions as to exercise need be enjoined. But when a patient's general health is deteriorating and he is

losing flesh, a physically restful life is necessary. Directions as to fresh air cannot be overdone. The only limitation to be advised relates to exposure to wind and rain.

Next we come to the question of diet. When a case of diabetes first comes under one's care it is good practice to permit the patient to partake of an unrestricted diet for two days, during which time the total elimination of sugar is carefully determined. It is not enough to learn that a certain percentage of sugar is found in the urine. We must determine the total excretion in the twenty-four hours. This having been determined, we proceed to gradually eliminate the carbohydrates from the patient's daily diet list, until at the end of two or three days more he is on a starch- and sugar-free diet.

The principle upon which the dietetic treatment of diabetes rests is that the restriction of carbohydrates for a period which varies in duration in individual instances, results in an increased ability on the part of the system to oxidize these food-stuffs, so that after a time the patient is able to partake of a mixed diet without detriment. All patients do not respond alike or equally well to this plan; hence, directions must be modified to suit special features in each case. Throughout the course of treatment the urine must be carefully examined, and the daily excretion of sugar, acetone, and diacetic acid carefully determined. The patient must be weighed at short intervals, for no patient can be considered as prospering if he is losing weight.

The standard diet which may be selected for getting rid of the glycosuria may be one of the following:*

1. **Von Noorden's Diet List.**—*Breakfast.*—200 grammes of coffee or tea with one to two teaspoonfuls of thick cream; 100 grammes of hot or cold meat (weighed after cooking). Butter. Two eggs with bacon.

*Lunch.*—Two eggs cooked as desired, but with flour, or any other *ors d'œuvre* free from flour. Meat (boiled or roasted), fish, venison, or fowl, according to taste, about 200 to 250 grammes altogether (weighed when cooked). Vegetables, such as spinach, cabbages, cauliflower, or asparagus, prepared with broth, butter or other fat, eggs, or thick sour cream, but without any flour; 20 to 25 grammes of creamy cheese (such as Camembert, Brie, etc.); plenty of butter. Two glasses of red or white wine, if desired. One small cup of coffee, with one or two tablespoonfuls of thick cream.

*Dinner.*—Clear meat soup with egg or green vegetable in it. One to two meat dishes as at lunch. Vegetable dishes as at lunch. Salad of lettuce, cucumber or tomatoes; wine.

Drinks during the day (exclusive of wine), one to two bottles of aërated water.

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* *Diabetes Mellitus, its Pathological Chemistry and Treatment*, p. 175.

In the Johns Hopkins Hospital, this diet list of von Noorden* has been modified to the following:

*Breakfast*, 7.30.—200 cc. (℥vj) of tea or coffee; 150 grammes (℥iv) of beefsteak; mutton chops without bone, or boiled ham; one or two eggs.

*Lunch.*—200 grammes (℥vj) cold roast beef; 60 grammes (℥ij) celery, fresh cucumbers or tomatoes with vinegar, olive oil, pepper and salt to taste; 20 cc. (℥v) whisky, with 400 cc. (℥xiij) water; 60 cc. (℥ij) coffee without milk or sugar.

*Dinner*, 6 P.M.—200 cc. clear bouillon; 250 grammes (℥vijss) roast beef; 10 grammes (℥ijss) butter; 80 grammes (℥ij) green salad, with 10 grammes (℥ijss), vinegar and 20 grammes (℥v) olive oil, or three tablespoonfuls of some well-cooked green vegetables, three sardines a l'huile; 20 cc. (℥v) whisky, with 400 cc. (℥xiij) water.

*Supper*, 9 P.M.—Two eggs raw or cooked; 400 cc. (℥xiij) water.

Either of the above diet lists will bring about the entire disappearance of sugar from the urine in three or four days, providing the case belongs to the milder classes. In other cases a longer period may be required, while in still others sugar persists, and it may even be that acetone bodies appear in the urine in dangerous proportions.

When we succeed in driving away all glycosuria, the carbohydrate free diet should be maintained for a period of two weeks, after which we should begin to test the patient's tolerance by adding certain foods belonging to that class to the daily diet list. It should be remembered, however, that all carbohydrates are not equally active in bringing about a return of the glycosuria; that ordinary wheat bread is the particular variety which it is especially desirable that the patient shall tolerate; that rest and exercise have considerable influence in promoting the patient's ability to assimilate carbohydrates; that such food-stuffs are better tolerated at one time of the day than another; and, finally, that *a priori* these several conditions connot be determined until experimental observations have been made, because we know practically nothing of the rationale of these peculiarities of the action of carbohydrates in different diabetics.

Bread being the standard carbohydrate food, we first test the patient's tolerance to it. We begin by permitting 50 grammes of white bread at the morning and noonday meals. If, after a few days, we find the glycosuria returns, we must regard the case as moderately severe, and must at once return to the strict anti-diabetic regimen. If the urine continues to remain sugar-free, we should add to his carbohydrate food little by little, until we find his point of tolerance. We should then return to a standard of living providing for about 50 per cent. of the quantity which provokes the glycosuria. Even then it may be advisable, after a time, to place the patient on a strict regimen for periods of one or two weeks.

* Osler's *Practice of Medicine*, sixth edition, p. 420.

If everything goes well, there will come a time when the patient's ability to assimilate carbohydrates has increased so that his diet may be made more generous, and, finally, he need practice only ordinary precautions. Under no circumstances should he permit himself to indulge to excess in sugars and starches; and it is a good plan for him to go on a restricted diet at periods to be named by his physician. In all cases it is essential to make very careful urinary examinations to determine the tolerance of the patient to various carbohydrate foods, as the different kinds of bread, potatoes, oatmeal, etc.

I have referred to the individual peculiarities of the diabetic. Thus, as regards rest and exercise, it has been noted that some patients can assimilate much larger quantities of the carbohydrates if he indulges freely in outdoor exercise, while others are made worse thereby, and thrive only on rest. Some can take carbohydrates safely at particular meals, the same conditions producing prompt disagreement in other patients.

Before proceeding with a study of the dietetic management of the more severe cases of diabetes, it is in order to consider some of the objections urged against the exclusion of the carbohydrates. Most of these objections originated some years back, when it was customary for physicians to place patients on a routine diet, no thought being entertained of personal idiosyncrasies. Hence it is that many of the older men entertain a strong prejudice against such dietetic directions. Had it been customary in those days to individualize cases when framing diet lists, such prejudices would never have arisen. Patients lost flesh; others suffered so from deprivation of certain articles of food, especially bread, that they secretly disobeyed instructions; and still others went into diabetic coma and died. All of these objections are readily overcome in the practice of the modern treatment of the diabetic.

One encounters great difficulty in overcoming the prejudices of neurotic diabetics, and these constitute a large proportion of the cases. By securing the confidence of the patient we can readily enforce our treatment for the few days necessary to secure good results, after which time the patient's feeling of improvement in all respects will remove any further difficulties.

Much has been said of those cases in which glycosuria and albuminuria co-exist. It has been too frequently assumed by physicians that the latter is significant of the presence of an actual nephritis. While in many instances, perhaps in the majority, this is a correct assumption, there still remain many cases in which the albuminuria disappears promptly when the anti-diabetic diet is enforced. It is necessary in the treatment of these complicated cases that the physician follow the patient's progress with more than ordinary precautions. As a rule, it is a good plan to limit the periods of restricted diet to two or three weeks at the most. The experience he gains from his observation of the patient and his clinical acumen will guide

him in his further management of the case. In all cases it is a wise plan not to push nitrogenous foods to an extreme lest diseased kidneys be overworked.

The final objection to the enforcement of a strict diet is found in the frequent appearance of the acetone bodies in the urine along with the disappearance of the sugar ; and the occasional onset of a fatal coma. As a matter of fact, the appearance of the acetone bodies in the urine is capable of taking place in perfectly healthy individuals when undergoing a carbohydrate free diet. It is, therefore, quite natural that the same thing should occur in the diabetic. So long as the presence of the acetone bodies is within reasonable limits this symptom should occasion no concern. As a rule, they disappear completely within a few days, eight or ten at the most. If they should appear in greater than normal quantities or should be persistent, the rigid diet is not indicated and should be discontinued.

As to the disastrous results which occasionally follow the enforcement of a restricted diet, it need only be said that practically all of such are in patients who have well advanced diabetes, and in whom a cure is out of the question. They are cases in which rigid treatment is contra-indicated by their very history, and none but a routinist would be guilty of braving the dangers incident to such treatment in this class of cases.

**Prophylaxis.**—By way of prophylaxis, it should be the duty of the physician to take special care of patients in whose families diabetes occurs with notable frequency. All such persons should have their ability to take care of carbohydrates tested from time to time. This may be done by administering 100 grammes of glucose on an empty stomach, The healthy individual should be able to take care of 180 to 250 grammes of sugar under like circumstances. If, therefore, glycosuria appears after 100 grammes of glucose, the quantity of carbohydrates given to such patients should be limited.

Taking now the moderately severe cases, *i. e.*, those in which a rigid diet, or at most one containing a very limited amount of carbohydrates fails to remove entirely the glycosuria, we find our best plan to alternate periods of restricted diet with longer ones in which the patient takes more liberal variety of foods. Some patients may do well on a strict anti-diabetic diet carried on for a period of years, but such are in the minority. We are sometimes sufficiently fortunate to increase the patient's tolerance, so that eventually the case may be relegated to the class of mild cases. Unfortunately, this happy outcome is unusual.

The severe cases of diabetes, *i. e.*, those in which proper dieting fails to eliminate the excretion of sugar, and at the same time the acetone bodies appear in the urine to a disquieting amount, demand the closest possible supervision. The probabilities of good results are not very flattering, so that one should not be disappointed if failure ensues. It is important that

in all of these cases to pay attention not only to the intake of carbohydrates but also to the quantity of meat consumed. Von Noorden is emphatic in stating that the latter should be restricted to 200 grammes daily. Of other proteids, the albumen of eggs and vegetables may be permitted, as they are better tolerated than is meat. This plan of dieting should be interrupted from time to time by periods of two or three days, during which the patient subsists mainly on vegetables, the proteids being reduced to the minimum. With such restricted diet, there is always a danger of exciting the acid intoxication of grave diabetes, to avoid which it is a wise precaution to prescribe large doses of alkalies, especially of bicarbonate of soda. With most cases, the acetone bodies continue to be increased in the urine for a week or so, after which they gradually grow less. At the same time the patient improves in strength and general health. If everything goes well, the problem at the end of the third week becomes simplified, for then we can permit the patient to take from 80 to 100 grammes of carbohydrate. We must, however, make careful observations to determine which of the latter class of food-stuffs is best tolerated. Even now it is important that the quantity of proteid be restricted. It is now well to follow von Noorden's plan of ordering two or three days of restricted diet and one "vegetable day" each month.

As to the carbohydrate to be allowed, of course, bread, as already stated, should be the one selected, if it is fairly well tolerated. The substitution of gluten bread and other anti-diabetic preparations is not satisfactory. In many cases they are arrant frauds, containing fully as much starch as the bread in ordinary use. In most instances they are unpalatable and fail to satisfy the patient's cravings. If wheat bread is inadmissible, it is better to try some other carbohydrate. Several authorities have advocated "cures" by special dieting with this or that carbohydrate. Thus, Mosse instituted the "potato-cure," Duering the "rice-cure," and von Noorden the "oat-cure." These systems agree in one important particular, namely, the patient's allowance of carbohydrate is limited to that obtained from one article of food to the exclusion of all others.

"The oat-cure," as prescribed by von Noorden, "consists in the daily administration of 200 to 250 grammes of oatmeal given in the form of gruel every two hours; 200 to 300 grammes of butter, and often about 100 grammes of vegetable proteid, or a few eggs, may be taken in addition. Otherwise, nothing else is allowed except black coffee or tea, lemon juice, good old wine, or a little brandy or whisky. Such a diet is often disliked by the patient, but I* have always succeeded in getting over this difficulty. After three or four days of it, follow one or two vegetable days. Often, even in this short time, the purpose for which it was intended is found to have been attained; in other cases, the same performance has to

* Von Noorden.

be repeated two or three times. It appears to be advisable to let a few days of restricted diet, or even one or two vegetable days, precede the oat-cure; for when it immediately supervenes upon a mixed diet the desired effect follows rather late.

"At the commencement of the oat-cure treatment, one notices, it is true, even in the most favorable cases, an increase of the glycosuria; but after a few days the sugar excretion diminishes, and the acetonuria even more so. During the oat days, the urine may often be quite free from sugar, and if it is not entirely free one may be fairly certain that it will be so in the succeeding vegetable days." The cases in which this treatment was beneficial were, without exception, examples of the more severe types of diabetes, many of them being in children and young adults. During the continuance of the treatment no carbohydrate other than the oatmeal should be permitted.

Throughout the course of treatment, whatever may be the plan adopted, close watch should be kept on the patient's weight, for no cases can be regarded as progressing favorably if the loss of weight continues. Careful record must be kept of the amount of food consumed daily, and the loss of sugar by the urine must be estimated. The latter must be recognized as so much loss of nutriment, which must be avoided.

Of the food substances to be utilized to prevent loss of weight nothing is better than the easily digested fats, especially butter and cod liver oil. When fats are not well tolerated, some alcoholic beverage, as whisky or brandy, may overcome the difficulty.

When the patient requires food to be sweetened, saccharin may be substituted for cane-sugar. Levulose or fruit sugar may also be prescribed.

The following is the dietary for diabetic patients as laid down in Thomas's diet tables:

*Soups.*—Consommé of beef, veal, chicken, turtle, terrapin, oyster, and clam, without flour. Chowder without potatoes; mock turtle, mullagatawny, tomato, gumbo fillet, oxtail.

*Fish.*—All kinds; lobster, oysters (rejecting soft parts), clams, terrapin, shrimp, crawfish, soft-shell crabs. If slight thirst, cod, mackerel, halibut. No sauces containing flour.

*Meats.*—Preferably fat. Cooked in any way except with flour. Poultry, calf's head, kidneys, sweetbread, bacon, ham, tongue, sausage, hash (without potatoes), pig's feet, tripe, eggs, all kinds of game (not breaded).

*Relishes.*—Pickles, radishes, sardines, anchovies, celery, olives, fish roe, caviare, endives, cream cheese, milk curds.

*Farinaceous.*—Gluten bread, gluten gems, gluten porridge, fried gluten mush, gluten wafers, gluten griddle-cakes, almond bread and cakes, charred

bread, bran cakes, soya bread, rye bread, glutens, nut-gluten biscuit. May occasionally substitute potatoes for bread. Substitute gluten for flour in soups and gravies.

*Vegetables.*—Truffles, lettuce, romaine, chiccory, cucumbers, spinach, sorrel, beet tops, cauliflower, cabbage, brussels sprouts, dandelions, tomatoes, oyster plant, onions, string beans, watercresses, asparagus, artichoke, parsley, mushrooms; all kinds of herbs; sauerkraut, okra.

*Dessert.*—Almonds, hazelnuts, walnuts, cocoanuts, Brazil nuts, pecans, filberts, butternuts, acid fruits, cherries, cranberries, gooseberries, coffee or lemon jelly, gelatin with wine, lemons, currants, cream custards, fruit jellies, and ice cream sweetened with saccharin or glycerin. In cooking acid fruits neutralize acidity with bicarbonate of soda or potash.

*Beverages.*—Tea and coffee without cream or sugar, buttermilk, koumyss, skimmed milk, plain soda, red wine, dry sherry, chablis, California Riessling or Zinfandel, Bass' ale or bitter beer, claret, burgundy. All in moderation. *Mineral Waters*—Alkaline and alkaline calcic. Saratoga, Waukesha, Bethesda, Poland, Highland Spring, Londonderry Lithia, Buffalo Lithia, Hudor Lithia, Aquzon, Vichy, Apollinaris, Carlsbad, Ems, Marienbad.

**Must Avoid:** Liver, wheat bread, corn flour, rice, sago, arrowroot, barley, oatmeal, tapioca, macaroni, puddings, beet-root, sweet vegetables, potatoes, carrots, peas, beans, parsnips, turnips, all sweet fruits, apples, pears, plums, grapes, oranges, apricots, peaches, dates, watermelon, prunes, bananas, chestnuts, peanuts, sweet wines, cordials, porter, lager beer, cider, mustard, honey, sweets, ices, jams, treacle.

The following are the directions for some special anti-diabetic foods:

*Gluten Bread.*—Less yeast is required than with starch flour, and less time in the raising process; very sour or old yeast should never be used. Take one quart of sweet milk or milk and water, one heaping teaspoonful of good butter, one-half cake of any fresh dry hop yeast, or one-fifth of a two-cent cake of compressed yeast, beaten up with a little water, and two eggs, well beaten. Stir in gluten till a soft dough is formed—about the consistency of a baking-powder biscuit. Put in pans to raise, and when light bake in a hot oven.

*Aleuronat Bread.*—Mix two ounces (62 grammes) of desiccated cocoanut powder with a little water containing a small quantity of German yeast. Make the mass into a sort of paste, and put in a warm place for half an hour or longer. The small amount of sugar contained in the cocoanut is almost entirely decomposed by the fermentation produced by the yeast, and the cocoanut paste becomes spongy. Add two ounces (62 grammes) of aleuronat, one egg beaten, and a small quantity of water in in which a little saccharin has been dissolved, and mix well until a dough is formed. Divide into cakes and bake in a moderate oven for twenty or

thirty minutes. If aleuronat is not obtainable, substitute good gluten flour containing at most 10 per cent. of starch.

*Two, Two, Two Gems.*—Stir two cups of gluten, two eggs, and a trifle of salt into two large cups of sweet milk or cream. Beat all well together, pour into very hot gem-pans, and bake in quick oven.

*Gluten Porridge* is made by stirring the gluten into boiling water until thick enough, and then keeping up the boiling process for fifteen minutes. A little salt and butter are added at the close to improve the flavor, and it may be eaten with milk or cream.

*Gluten Cream Wafers.*—Stir gluten (crude or purified) into sweet cream until the dough is thick enough to roll out to the thickness of pasteboard. A little salt may be added if desired. Cut in any form and bake to a delicate brown.

*For Soups and Gravies.*—Gluten is better than flour. It is frequently delicately browned for these purposes.

*Biscuit of Bran Flour.*—To one quarter of a pound of flour add three or four fresh eggs, one and a half ounces of butter, and half a pint of milk; mix the eggs with a little of the milk, and warm the butter with the other portion; then stir the whole together well; add a little nutmeg or ginger or other agreeable flavoring, and bake in small forms or patterns. The cake, when baked, should be about the thickness of an ordinary captain's biscuit. The pans must be well buttered. Bake in rather a quick oven for half an hour. These cakes or biscuits may be eaten with meat or cheese for breakfast, dinner, or supper; at tea they require rather a free allowance of butter, or they may be eaten with curd or any soft cheese.

When the diabetic patient does not thrive despite what appears to be well-devised instructions, it is a good plan to take him from his work and place him under the constant observation afforded by a private room or ward in a well-conducted hospital. The origin of the difficulties is thus determined, and in the course of two or three weeks the patient is able to conduct his treatment properly at his home.

**Medicinal Treatment.**—Very diverse views exist respecting the value of medicines in the treatment of diabetes. One contends that medicines are utterly worthless, another that they are the *summum bonum*, and still others take a middle ground, claiming that medicines are useful as supplementing the beneficial effects to be derived from dietetic and general hygienic regulations. In prescribing for a diabetic subject we should follow one of two courses: When the condition present is such as to be the unequivocal result of the diabetes, our prescription should be based in great measure upon the pathological condition present. When, on the other hand, we have to deal with nervous, circulatory and digestive disturbances, which are liable to exert a bad influence on the fundamental disease, our medication must be directed against them. For the latter conditions, the

remedy must be prescribed according to symptomatic indications. No mention of these remedies need be made here, as the reader will find reference to them in the chapters dealing with diseases of the nervous system, stomach, and circulation.

The majority of our authorities agree in placing *Phosphoric acid* at the head of the list of anti-diabetic remedies. The question as to whether its beneficent action is due to a direct homœopathic relationship has been ably argued by Hughes and others. According to Hughes, the remedy has actually produced glycosuria in the lower animals, and Griesenger has discovered that it aggravated the condition when given in material doses, *i.e.*, one ounce daily. On the other hand, clinical observation has demonstrated that it has done the most good in just the class of patients in whom we expect Phosphoric acid to be most efficient, *i.e.*, in neurotic subjects, who have emaciated considerably and are weak mentally and physically. It is especially indicated when there is a history of mental strain, as from worry or overwork, or of sexual excesses. The mental state of the patient is usually one of despondency or apathy. Phosphoric acid is also mentioned favorably by Ringer.

*Uranium nitrate* has been extensively used by physicians of both schools of medicine. Its ability to produce glycosuria has been demonstrated by Woroseilski and Cartier. Aside from homœopathic physicians, its value has been attested by West and Bond. Those of our own school who have made claims for its virtues include Hughes, Goodno, Jousset, Curie, and Love. Most of the cases have been treated with the first and second decimal triturations. As compared with Phosphoric acid, it is better adapted to cases originating in digestive and assimilative disturbances. Halbert advises it in from one to three grain doses administered in water after meals.

*Aurum muriaticum* and *Arsenicum* have always been prominent remedies in the treatment of diabetes. This has been recognized by the extensive use of a proprietary preparation, which is a chemical combination of these two drugs. *Aurum muriaticum* is indicated in cases presenting neurotic or hysterical symptoms, especially if attended by arterio-sclerosis or dependent upon syphilitic infection. The mental condition is one of depression and apprehensiveness.

*Arsenicum album* is indicated in cases with marked thirst, emaciation, dry skin, anæmia, general restlessness, gastric irritability, and dyspnœa. It is also to be regarded as one of the prominent remedies for certain of the complications of diabetes, as furuncles, gangrene, carbuncles, and diarrhœa. Various natural arsenical waters have achieved considerable reputation in the treatment of diabetes. The dose of Arsenic is rather elastic, some physicians using it mainly if not entirely in the dilutions, while others claim the best results from two or three drops of Fowler's solution administered at four-hourly intervals.

Goodno has recommended the *Arsenite of Strychnia* "when the nervous system was at fault, the patient being exceedingly weak and irritable." Other arsenical preparations that have been advised are *Arsenicum brom.* and *Arsenicum iod.* Their use is based mainly on empirical considerations. Some old-school physicians have recommended Donovan's solution, which is a solution of the iodides of Arsenic and Mercury in very nearly the proportion of their molecular weights, and containing them mixed, but not combined chemically. The dose is one to five minims well diluted three times daily. Hale recommended the *Arsenite of Iron* in the second decimal trituration when anæmia is especially prominent.

*Syzygium jambolanum* is one of the newer remedies capable of producing glycosuria. The results obtained from it are generally regarded as uncertain. Dudgeon reported two cases in women in which it greatly reduced the sugar excretion and relieved the pruritus, and in one male patient, aged 56, it entirely relieved the disease. Hale reports cases but with negative results. Viehe used the drug in 8 to 10 drop doses, and reports one cure. Moffatt contended that he obtained the best results from the 12th dilution, the larger doses producing a high degree of intestinal irritation in his experience. Hare remarks concerning this remedy that it "has been widely used by clinicians for the relief of diabetes with such varying results that its position in therapeutics is uncertain. This is probably because it is effective in one form of diabetes and not in another, and we are unable to make the clinical distinction."

*Plumbum metallicum* was regarded by Hering as the leading remedy for cases in which diabetes and interstitial nephritis are associated. *Plumbum iod.* has been recommended in uncomplicated glycosuria.

When tuberculosis supervenes upon diabetes, *Creosote* is unquestionably the best remedy. Goodno speaks of its effects in glowing terms, advocating its administration both by the mouth and by inhalation. Special indications for it include gastric irritability, flatulence, and rapid administration.

*Phosphorus* may also be considered in connection with the treatment of those cases in which tuberculosis and diabetes are associated. It is also indicated in the subjects of gouty diathesis, cerebral disease, and fatty degenerations.

*Picric acid* is sometimes of advantage in neurasthenic subjects, in which the mental condition is one of extreme indifference and entire loss of will-power. Increased sexual desire with involuntary emissions is a prominent feature. The patient presents great languor and prostration.

Other remedies to be studied include *Nux vomica, Bryonia, Leptandra, Lycopodium, Podophyllum, Lactic acid, Ferrum phos., Calcarea phos., Silicea, Kali bromatum, Kali phos.*

In cases of diabetes pursuing a malignant or acute course, but little

can be hoped from medicinal measures. Here we may try *Morphia* and *Curare*.

Among the remedies recommended by old-school authorities, the most prominent are the preparations of Opium and the Salicylates. It is generally admitted, however, that the opiates do but little good unless the patient is placed upon a stringent anti-diabetic diet. It has been noted that when the latter fails to eliminate the sugar from the urine, the administration of Opium serves to lower the percentage of sugar to a still greater degree. Diabetics exhibit a remarkable tolerance of this drug. Different authorities exhibit preference for different preparations. Pavy, whose experience with diabetes is very large, prefers Codeia as being the least likely to constipate. He begins with half a grain three times daily, and gradually increases the dose until the patient is taking six to eight grains a day.

Testimony as to the value of the *Salicylates* is decidedly contradictory. It is more than probable that these remedies are valueless.

Forchheimer speaks very highly of *Urotropin*. His discovery of its favorable action in diabetes was the result of an accident. In a case complicated with pyelitis it relieved both the pyuria and the glycosuria. This led to further clinical experiments with the drug, and several other cases were noted in which it had an unmistakable action in aiding in the disappearance of the sugar from the urine.

Wood and DaCosta placed considerable reliance upon Ergot. Clinicians of the present day have little or nothing to say in praise of this drug.

Syphilitic cases usually yield very satisfactorily to antisyphilitic medication, especially to Potassum iodide.

Opotherapy has thus far proven very unsatisfactory. Experiments in this direction have been limited to the administration of glycerin extracts of the fresh and dried pancreas. Favorable results have been few and far between.

As already stated, diabetic coma is dependent upon an acid intoxication, the offending substance being $\beta$-oxybutyric acid. This appears in the urine in combination with potassium, sodium, and ammonium. The tests for its presence are too complicated for use by the general practitioner, nor are they necessary, for the appearance of the derivative bodies, acetone and diacetic acid, is sufficient to sound the signal of danger. When, therefore, the ferric chloride reaction appears, energetic measures must be instituted. The most important is the administration of carbohydrates with the food. Even though coma develops, the carbohydrates should be fed the patient so long as he is able to take nourishment. At the same time, it is of the greatest importance that fats be withheld in great part. Butter in particular is regarded as injurious.

When diabetic coma appears there is but little hope that any measures will prove of much avail. Still, we may try large doses of *Bicarbonate of*

*soda* by the mouth, or follow the recommendation of Fagge, administer intravenous injections of the solution of that drug. Occasionally, the patient is restored to consciousness; but the improvement is usually of but a few days duration.

When administered by the mouth the dose of *Sodium bicarbonate* must be large, sufficient, indeed, to keep the urine alkaline. When given intravenously a 2 per cent. solution in a normal salt solution is the best. Of this one litre should be administered at a time. Osler advises that all patients in whom a marked diacetic reaction exists in the urine should be placed on Sodium bicarbonate, the dose of which may amount to as much as three ounces in the twenty-four hours.

The **pruritus** is due to the local action of the sugary urine on the external genitals, and so is met in most cases by the same treatment that benefits the constitutional disorder. Local measures of value are mostly of a cleansing nature, and include proper ablution after each urination followed by applications of Boric acid or Sodium hyposulphite solutions, the latter in the proportion of one ounce to the quart of water.

**Thirst** may be best allayed by the drinking of acidulated water, or by drinking alkaline non-purgative mineral waters. It is not advisable, as a rule, to restrict the patient in the amount of plain water he shall drink, though he should be advised to practice moderation as much as he possibly can without causing suffering.

## Diabetes Insipidus.

Until the pathology of diabetes insipidus shall have been thoroughly determined, the clinical study of this disease must be intimately associated with that of polyuria in general. Diabetes mellitus we recognize as a special clinical entity, demanding its own particular line of treatment. The purely neurotic cases of polyuria are almost invariably of temporary duration and require no treatment. There still remain certain cases of polyuria in which it is evident that the cause is renal disease (as interstitial nephritis and amyloid disease), increased vascular pressure, and certain cases of undetermined origin, which we are at present pleased to regard as a special disease, which we call diabetes insipidus. There are some who contend that diabetes insipidus is after all but an atypical variety of interstitial nephritis; but the facts bearing on the question are against this conclusion.

**Polyuria Dependent upon Chronic Renal Disease** must be regarded as a conservative process and, therefore, must not be subjected to any therapeutic interference.

**Polyuria Associated with Chronic Brain Disease** demands that most of the treatment be directed against the fundamental cause. Inasmuch as the lesion in most of these cases is in the pons, medulla, or cerebellum, the therapeutic results are anything but satisfactory, excepting in those cases in which the lesion has a syphilitic basis.

Aside from the production of organic brain disease, **Syphilis** may give rise to polyuria in an indefinite sort of way not yet understood. Such cases have been generally assigned to diabetes insipidus, and, as a rule, yield nicely to the administration of Potassium iodide.

Cases of diabetes insipidus apparently dependent upon arterio-sclerosis or increased vascular pressure, are usually benefited by *Potassium iodide.* The method of administration of the drug in these cases must be very different from that practiced in syphilitic cases, for small doses, *i.e.*, five to ten grains three times daily, are usually efficient.

Hygienic measures do not seem to be of much use in true diabetes insipidus unless they exert some influence on underlying lesions, *e.g.*, tuberculosis. There are conditions which unquestionably aggravate the polyuria, as indulgence in alcoholics, and diuretic foods, as watermelons, canteloupes, and grapes. Mental influences, as worry, fatigue, must be avoided. Judicious out-of-door exercise undoubtedly is beneficial in those who can stand it, as it aids in the excretory activity of the skin and lungs and thus lessens the elimination by the kidneys. It has been recommended that the patient take up a residence in a dry climate having a high elevation, *i.e.*, from 4,000 to 6,000 feet, as in Colorado, New Mexico, and Arizona; but when one considers the very unsatisfactory results following the treatment of the severe cases, he may well ask himself if it is worth while to advise such a radical and expensive move. It is very difficult to see how free catharsis by drastic purgatives can be of any avail; indeed, such a course would impress one *a priori* as positively harmful.

Drink restriction is very largely a matter of experiment. In those patients in whom excessive indulgence in water has become a habit, it is unquestionably wise to lessen the daily intake of water until the patient is finally taking but three to four pints in the twenty-four hours. In still other cases, in which the indulgence is for the satisfaction of thirst, a gradual reduction in water consumption may prove of value, while in still another class the drink restriction is positively harmful, aside from the suffering it occasions the patient. One can never tell until he has tried the experiment just what cases will be benefited by the use or disuse of water.

The remedies that promise the best results are those of diuretic character, and include *Apocynum, Scilla, Strophanthus,* and *Phosphoric acid. Aurum mur., Argentum nitricum, Arsenic, Euonymin, Natrum salicyl., Natrum benzoic.*, and *Phosphorus* have been recommended by Blake. Halbert mentions *Strychnia phos., Phosphorus,* and *China* when nerve depletion is pronounced, and *Ferrum phos.* in anæmic cases.

In a case treated by me in the Hahnemann Hospital considerable improvement in the general symptoms and diminution in the daily quantity of urine resulted from the administration of small doses of *Agurin* (gr. j) three times daily.

Old-school authorities still adhere to their recommendation of *Opium*, *Valerian*, and *Ergot* in increasing doses as offering the best results; and yet none of them are overly enthusiastic as to these remedies.

### Arthritis Deformans.

It is unfortunate that the term rheumatoid arthritis and rheumatic gout continue to be applied to arthritis deformans, for this disease has no clinical or pathological relationship to either rheumatism or gout. The preservation of the older titles stand in the way of a rational therapy, for as long as they continue to be used physicians will retain a half-formed idea that cases of arthritis deformans must be treated on either the gouty or the rheumatic hypothesis.

The disabling character of the disease should lead us to adopt energetic and systematic treatment from the beginning. Notwithstanding the gloomy outlook, it is remarkable what can be accomplished by good judgment and perseverance. The nature of the disease is such that we have no right whatever to expect any reasonable improvement from a given course of treatment under several months. Patients should be made acquainted with this fact, that they may give the suggested treatment more serious consideration.

The majority of cases occur in women who are anæmic, neurotic, and in a state of general malnutrition. This affords us one of our important therapeutic indications. Patients should be put on as full diet as their digestive powers will permit. Due consideration must be taken of the quantity of food as related to the limited daily exercise. Massage then comes in as a valuable adjuvant, as it hastens tissue changes, as does exercise, and enables patients to take more food than they otherwise could. Of special advantage are foods rich in fats, those to be especially commended being butter, cream, bacon, and cod liver oil. Due consideration must be given to a proper mixture of animal and vegetable foods, neither being prescribed to the exclusion of the other.

While thus directing the diet, very strict supervision must be had over the digestion, the condition of the bowels, and the daily quantity of urine.

The patient with arthritis deformans is very liable to be possessed of "a weak stomach." The pathological basis of this complication must be determined. In many instances it is a neurosis, and must be regarded as such, so far as the forcing of food is concerned. In other cases, it represents actual organic conditions, in which case it is to be treated accordingly.

When the course of the disease is interrupted by febrile attacks with exacerbation of pains and symptoms generally, it is a wise plan to restrict the patient's diet for a time, as one would do had the same symptoms appeared under other circumstances.

So far as the disease *per se* is concerned, there is no objection to the

administration of alcoholic beverages in small quantities. Light wines in moderate quantities may stimulate the appetite and render the digestive process more comfortable.

One of the great difficulties with which we have to contend is the continuance of the old idea that these cases are to be treated by starvation. Hence it is that with few exceptions patients come to us in a far more debilitated condition than the ravages of their illness can produce.

If food is to be taken in reasonable quantities, we must see to it that the bowels act regularly. We should endeavor to bring this about by diet and general measures when possible. If these fail, then we must use laxatives, of which Cascara is the best. We may for short periods of time prescribe *Sodium phosphate*, *Hunyadi water*, etc.

The daily quantity of the urine should be determined from time to time. If it is known that it is deficient in quantity or specific gravity, or both, hygienic measures appropriate to these conditions must be prescribed. It is generally impossible to bring the urine up to the desired standard, but it can be improved by such means as the free drinking of a good spring water and full diet.

When the financial condition of the patient will permit, he should live in a mild and dry climate and at a relatively high altitude. Fresh air is known to be a valuable adjuvant, and this the patient cannot have with comfort if he continues to live in a rigorous winter climate. When considering the change, patients will solicit the physician's opinion as to the advisability of going to some of the well-known springs or cures, There can be no objection to the latter, if it is known that the patient, while there, will not be subjected to too debilitating measures, of which the vapor bath is a good example. While patients visit these places for the baths, they should distinctly understand that it is not the composition of the waters that gives the treatment its value. Results depend upon the manner of administering the baths, the temperature of the water, and the associated massage. So true is this, that patients should not be encouraged to leave home with its surroundings and comforts if they go only for the hydrotherapy.

The best hydriatric measure in arthritis deformans is douching with warm water combined with rubbing. Warm immersion baths are excellent also, but they must not be repeated too frequently, or they will do harm. Hot air baths may be tried, but here again precautions must be observed lest they exert a debilitating influence. Ringer recommends baths to which 20 grains of Arseniate of soda and four ounces of ordinary washing soda have been added. Turkish baths have been recommended by some authorities, and undoubtedly are invaluable in selected cases. Their influence for good or evil must therefore be carefully watched.

When patients can afford it, they should be under the constant care of a masseur. Massage unquestionably reduces the local inflammation. By

passive movements it increases the mobility of the joints. It also lessens the atrophy of the muscles moving the affected articulations.

Recently a few clinicians have reported some good results by the induction of passive congestion of the affected joints. Thus far the practice of this treatment has not been systematized in the treatment of arthritis deformans. It promises much—more, indeed, than any measure recently advocated.

For the relief of pain, warm or hot applications to the joints are invaluable. Grawitz* has proposed enveloping the joints in hot sand-baths at a temperature of 122° F., continued for from 30 to 60 minutes. They lessen the pains and articular effusion, and produce an abundant perspiration.

Electric baths were highly thought of by Steavenson, as quoted by Garrod:† "A copper plate connected with the negative pole of a constant current battery is placed at the foot of the bath, and another similar plate connected with the positive pole is placed at its head. The head and shoulders of the patient are supported by a wooden frame, across which webbing is stretched, which prevents the body from coming into contact with the metallic plate.

"The bath should be taken under competent medical supervision, and the patient should remain in it for ten minutes, while a current from about 40 Leclanche cells is passed through the water. As an alternative arrangement, the current may be reduced and the negative pole may be connected with handles which are held by the patient."

Goodno‡ speaks of having used galvanism to the affected joints for the relief of pain. The same authority speaks more highly of spinal applications of galvanism. The seances should be daily of 15 to 20 minutes' duration, and the current strength 20 milliamperes. It should be remembered that such long sittings and strong currents must produce local irritation unless the electrodes are large and their positions changed every few minutes.

In a general way, it may be said that the medicines useful in patients with arthritis deformans have no clinical relationship to either rheumatism or gout. Thus, the Salicylates and Colchicum are utterly useless. On the other hand, we do obtain some benefit from remedies which improve the general health. In cases occurring in women (and these are the majority), *Pulsatilla*, *Sabina*, *Actea racemosa*, *Sepia*, *Collinsonia*, and *Sulphur* are useful.

Of these remedies, *Actea racemosa* is unquestionably the most efficient. Its symptomatology includes a number of joint symptoms, and it is highly recommended by Ringer in 10 minim doses of the tincture. It relieves

* *University Medical Magazine*, February 1896, p. 376.

† *Twentieth Century Practice of Medicine*, vol ii, p. 571.

‡ *Practice of Medicine*, vol. ii, p. 898.

the cramps in the muscles and the nocturnal pains aggravated by damp weather. It is rather surprising that this drug has not received higher mention in our literature, for we find its uterine symptoms of very common occurrence in arthritis deformans patients. *Actea spicata* is more frequently referred to, it being especially adapted to changes occurring in the smaller joints, as those of the fingers.

*Pulsatilla* is indicated almost exclusively by the collateral symptoms, though it has important articular phenomena in its pathogenesis. Gastric symptoms, delayed menstruation, shiftings pains, and the relief afforded the patient by being in the open air are our important guides to its administration.

*Sabina* is recommended by Hughes * in "the frankly inflammatory form," especially if there is menorrhagia. Unlike the average patient with arthritis deformans, those to whom Sabina is applicable are plethoric.

*Sepia* presents a general clinical picture which corresponds to many of the sufferers from the disease under consideration. The sallow complexion, the spare build, and the uterine symptoms are all strong indications. The patient complains of a feeling of fulness in the abdomen, bearing-down sensations in the pelvis, and constipation with a sensation as of a lump in the rectum.

*Collinsonia* is indicated in cases presenting a general similarity to the Sepia patient, with constipation, hæmorrhoids, dysmenorrhoea, and enlargement of the smaller joints.

*Benzoic acid* is indicated by painful nodes in the joints. The patient complains of wandering pains, especially about the heart. The bladder is irritable. The urine, even when freshly voided, presents a strong ammoniacal odor and is highly colored. Goodno prescribes the *Benzoates of Lithium and Ammonium* in cases presenting the symptoms of Benzoic acid.

*Causticum* is adapted to the advanced stage of the disease, when the joints are more or less anchylosed and tendons are shortened. The pains and stiffness are relieved by warmth. The patient is restless at night. The parts especially involved besides the extremities are the jaw articulations and the shoulder.

*Guaiacum* and *Ledum* deserve special mention for nodosities in the fingers.

*Colchicine* is a remedy proposed by Goodno † as of the greatest importance. It is evident, however, that he does not propose it as a routine prescription, for he speaks of it as being effective "when the inflammatory changes have first appeared in the terminal finger joints, attended by swelling, slight sticking pains, and sometimes redness. The best results have been secured in the treatment of the subacute attacks involving the knees

* *Principles and Practice of Homœopathy*, p. 298.

† *Practice of Medicine*, vol. ii, p. 887.

or some of the larger joints, and attended with considerable effusion." It is hardly conceivable that Colchicine can be of much use in patients presenting any degree of anæmia. The dose recommended is $\frac{1}{200}$ of a grain every two to six hours. Care must be exercised lest this dosage produce diarrhoea and other symptoms indicative of the physiological action of the drug.

*Carbolic acid* deserves serious consideration in the treatment of this and other chronic arthritic inflammations. I have made extensive use of it internally and hypodermically with most satisfactory results. It is by no means a specific. I am not able to individualize and describe with any accuracy as yet just the cases in which it will do the most good. It should, therefore, be advised as a remedy to prescribe in cases in which the better known and orthodox remedies fail. Later, we will be able to discover specific indications. A 25 per cent. solution of the chemically pure crystallized acid (Merck's) is the preparation I prescribe. Of this five minims well diluted are administered four times daily. In the course of a few days the quantity may be increased, until at the end of two weeks the patient is taking 15 minims four times daily, providing, of course, the patient does not exhibit symptoms due to the administration of the Carbolic acid.

For hypodermic use we may employ the 2 per cent. solution as advocated by Goodno. (*Vide* article on *Rheumatic fever.*)

The *Iodides* are of considerable value in arthritis deformans. Of these, the *Iodide of iron* occupies the most prominent place. It should be administered in the form of the syrup, as recommended by Garrod.

Additional remedies to be considered in the treatment of arthritis deformans are *Fraxinius excelsior, Ichthyol, Calcarea carb., Aurum mur., Ammonium phos., Sulphur iod., Calcarea phos., Manganum, Natrum sulph., Rhododendron, Arsenic, Belladonna, Æsculus,* and *Mezereum.*

## Chronic Rheumatism.

The term "chronic rheumatism" should be accepted under protest, as the various clinical conditions grouped under this title are quite varied. It would be much better if we were to designate this class of cases as chronic polyarthritis until such times as our increased knowledge of their pathology enables to assign each of said classes to its proper heading. The principal objections to the prevalent faulty nomenclature is that it allies the chronic polyarthritides with arthritic fever, with which it probably has no pathological relationship, thus leading physicians to treat the diseases in an identical manner. Under present conditions we are unfortunate in being obliged to submit to the misnomer to which I have objected.

The treatment of chronic rheumatism must be conducted on etiological and symptomatic grounds. The assertion that chronic rheumatism is dependent upon arthritic fever is sadly in need of confirmation. I cannot re-

call at the present time a single case in my personal experience in which this relationship of cause and effect existed. Authorities make the claim, however, and we must submit to it, until elaborate clinical investigations prove them to be wrong.

Chronic rheumatism is especially common among the poorer and working-classes, who are much exposed to dampness and cold, and whose occupations force them to use considerable exertion under unfavorable hygienic conditions. Many of them are insufficiently or injudiciously clad. This gives us some important hints as to treatment. Rheumatic patients *must* domicile themselves so that they cannot be exposed in their homes at least to the deleterious effect of damp and cold.

When engaged in arduous labor, which necessitates free perspiration, they should not expose themselves to strong drafts of air, but should permit themselves to cool off gradually. The diet must receive careful attention. The prevalent idea that animal food is detrimental and should be eliminated is erroneous. It is necessary that the patient be well nourished. To this end, he should take as much food of mixed character as his digestive apparatus will take care of without discomfort. Meats are permissible, but should not constitute the main article of diet. The current recommendation that red meats are objectionable seems to have no foundation in fact, unless it be that the lighter animal foods possess less nutritious qualities, and therefore present a smaller quantity of substances absorbed to be taken care of by the viscera.

Clothing demands the exercise of judgment. In the majority of cases the undergarments should be of woolen material, the weight of which is adapted to the weather. Exception may be made during the hot summer months, when lighter materials should be used. Very many patients find the linen-mesh underwear much better than those made of wool. In fact, I have had several rheumatic patients who recovered entirely with no other treatment than the linen-mesh underwear. As to the other clothing, it should be so arranged that the patient can keep himself comfortable according to his surroundings. Thus it is better for him to wear ordinary clothing of moderate weight, and make up for its deficiencies when out-of-doors by extra weight or warmth of his overcoat. The reader may say that all this costs money; so it does, but that does not prevent the poor man who is rich in expedients from putting the principles inculcated into practice. For example, what is cheaper and more convenient as an extra protective in extremely cold weather than a fold or two of newspapers wrapped about the body and under the coat or vest?

The affected joints should be well protected by layers of flannel. Dealers have on sale special binders or protectors made of wool or linen-mesh for this purpose. The poor man can use ordinary flannel bandages.

Climate is a very important therapeutic question. Patients who can

afford to do so, should winter in the South or in a mild climate while pursuing their ordinary avocations during the milder months of the year. Others may find it advisable to make a complete change of residence, because of their inability to stand the expense of changing abodes with the seasons.

The use of the actual cautery is debatable. Some are strong advocates of it, making small burns in the neighborhood of the affected joints. Others advise the application of blisters about the size of a quarter of a dollar. The cautery is probably better than the blister, because it is entirely under the control of the physician. While it causes more pain than the blister for the few seconds it is applied, the patient is much more comfortable afterwards.

Massage is very valuable, especially when combined with passive motion of the affected joints. It reduces the inflammatory exudate and prevents anchyloses of the joints and muscular atrophy.

Hydriatric measures ofttimes prove useful. There is no definite rule to determine just what will bring relief. Some advocate the wrapping of the joints in cloths wrung out in cold water and covered with a layer of flannel and then oiled silk. Still others recommend hot baths, and the drinking of alkaline waters.

The Salicylates, which are so useful in arthritic fever, are practically useless. The only one that has given me any satisfaction is *Mesotan*, which must be used locally. Care must be exercised in the use of this drug, as it is capable of producing a very obstinate dermatitis. Still, if used by mixing with equal parts of olive oil, and merely painted over the affected joints, which are then wrapped in flannel, it very seldom has any deleterious effects.

The range of remedies useful in chronic rheumatism is a large one. *Potassium iodide* is undoubtedly the most efficient; but it should always be given in small doses, *i. e.*, five grains three times daily after meals and well diluted. Other medicines to be recommended are *Bryonia*, *Rhus*, *Colchicine*, *Ledum*, *Pulsatilla*, *Phytolacca*, *Lycopodium*, *Mercurius*, *Hepar*, *Benzoic acid*, *Actea racemosa*, and *Sulphur*.

**Gonorrhæal arthritis** calls for *Pulsatilla* or *Sarsaparilla*.

The results from the treatment of the various chronic polyarthritides would probably be better if we could imbue patients with the idea that their prognoses are not as bad as painted, and that it is a disease to be treated seriously. In other words, our hygienic measures and remedies would bring better results if we confined the patients to their beds, or at least to their homes, during the periods of renewed activity of the pathological process.

I might also say in closing that many of the bad results in the treatment of rheumatic affections, so-called, lie in the lack of interest taken in

them by physicians, and the hopeless view taken by patients as to possible results. It is quite natural, therefore, that rogues (quacks) find abundant opportunities for attempting the work that should be undertaken perseveringly by honest physicians. The nature of the rheumatic affections demands careful attention to details in treatment, which must be carried out for a prolonged period of time if success is to be attained.

## Myalgia.

Myalgia or **Muscular Rheumatism** may be either acute or chronic. The acute variety of the disease is usually a very simple matter, as it yields in a very short time to rest of the affected part, applications of dry heat, and internal medication. The rest should be arranged according to the situation of the affection. If in the back (**Lumbago**), all movements are painful, and the patient must be kept in bed; if in the legs, again confinement is necessary. On the other hand, when it invades the muscles of the shoulder, the demands of rest are fully satisfied if the affected extremity is supported in a sling.

As in other rheumatic affections (so-called), applications of dry heat are invaluable. In the case of lumbago, a very efficient device is the placing of a couple of thicknesses of flannel over the back, and ironing the parts through it with a hot iron. This scheme is hardly adaptable to other parts of the body. There we must rest satisfied with coverings of flannel or the application of hot-water bags.

The acute cases do very well without massage, although occasionally we find that a good rubbing greatly shortens the duration of an attack.

The prevention of myalgia in those predisposed is usually a simple matter. The advice already given under chronic rheumatism as to clothing holds good with this affection. The arrangement of exercise is a most important matter. It has been noted that myalgia comes on after excessive exertion in those unaccustomed to it, from exposure to drafts of air when over-heated, and from long periods of use—it might be called abuse or strain—of one or more muscles. In advising exercise for the prevention of myalgia we should instruct the patient to employ such gymnastics as utilize all the muscles of the body.

The remedies applicable to acute myalgia are few but efficient. For general myalgia with fever, *Gelsemium*, *Bryonia*, and *Eupatorium*. For **Lumbago**, *Rhus tox.*, and *Bryonia*. For **Pleurodynia**, *Bryonia*, and *Ranunculus bulbosus* and *Actea racemosa*. For **Omodynia**, *Phytolacca*, *Sanguinaria*, and *Ferrum*.

It has been asserted that some cases of muscular rheumatism are but anomalous attacks of arthritic fever. There is considerable to fortify this view; hence it must be respected. Such cases must be treated by the *Salicylates* and their derivatives or *Colchicine*.

If pain is so intense as to require an analgesic, we may prescribe *Acetanilid* or *Morphia*. The latter is the most certain in its results but, as a rule, Acetanilid will be more satisfactory because of the absence of after-effects in persons who are possessed of an idiosyncrasy to Morphia.

Sometimes local pain may be relieved by the application of a Belladonna plaster; though I have never found it necessary to use it.

After the subsidence of an attack, and before the patient has fully recovered his strength, the application of strips of oxide of zinc adhesive plaster over the affected area gives the patient great comfort by reason of its support. Much of the advantage of medicated plasters is derived from their purely mechanical action.

In the chronic form, we must enforce the instructions as regards climate and clothing, as laid down in the article on chronic rheumatism. Massage is to be regarded as even of greater importance in this than in the preceding disease. Electricity, which has usually been found without value in chronic articular rheumatism, has given some very good results in myalgia. The most efficient method of application has been found to be faradism of the affected muscles. In cases in which this fails, galvanism without interruptions of the current should be tried. Some have advocated static electricity. In very obstinate and long-continued cases of lumbago, Grant's treatment by acupuncture may be tried.

## Gout.

Gout attacks persons who are known to be predisposed either by heredity or by reason of having had one or more outbreaks of the disease. Prophylactic treatment is therefore an important matter. This may be summed up in a few words: Auto-intoxication is the fundamental cause of the attacks. The patient should therefore live in such a way that he does not take into his system such substances as tend to promote this condition. He must see to it that there is sufficient elimination of toxins. To this end, he should eat moderately, though sufficient, to satisfy the demands of nutrition. He must avoid an excess of nitrogenous food. Meat once daily is sufficient. He must avoid an excessive indulgence in starches and sugars, as these promote intestinal fermentation. He must drink an abundance of water, as this more than anything else promotes elimination by the kidneys. Alcoholic beverages of all kinds should be forbidden. The malt liquors are more injurious than the distilled. Exercise must be indulged in with discretion, which means according to the condition of the individual. Many attacks of gout occur in comparatively young men who are lovers of outdoor sports. To them this advice does not apply. There are others who are of sedentary habits and occupations. These, if in good general health otherwise, should be made to walk, play golf, or indulge in some sport according to the condition of their hearts and arteries. Lastly, there comes

a class of patients advanced in years, broken down in health, with weak hearts and bad arteries. Such individuals cannot exercise excepting in the mildest manner possible without danger. To them our advice must be fresh air and but little exercise.

**Treatment of the Acute Attack of Gout.**—The patient with an acute attack of gout should be kept in bed with his affected extremities somewhat elevated. The inflamed joints should be well covered with cotton batting, and this in turn with woolen fabric. Some authorities advise that this dressing be saturated with various medicaments, of which Opium is among the most important. Such local medication is not at all necessary, and it is very doubtful if it does any good.

His diet should be strictly liquid, milk being preferable. He may, however, be indulged in weak broths in moderation if the milk diet becomes monotonous. If he claims, as he frequently does, that milk disagrees, it may be mixed with bicarbonate of soda in the proportion of ten grains to eight ounces of milk; or the milk may be diluted with one-half its bulk of lime or barley water.

In the vast majority of cases, alcoholic beverages of all kinds must be forbidden positively. Exceptions are permissible only in those individuals who have had several attacks, and whose general nutrition is bad, and as a result they are greatly weakened. Then we may prescribe small quantities of whisky or brandy as being the most effective stimulant and the least injurious.

It is very important that good action of the bowels be secured early in the attack. For this purpose, we should use one of the saline purges, as Hunyadi water, Carlsbad salts, or Magnesium sulphate. The latter may be given most conveniently in doses of one tablespoonful of a saturated solution every hour until it acts freely.

Water is a very important eliminant, and the nurse should be instructed to have the patient drink of it so freely that he takes not less than two quarts of water in twenty-four hours. The alkaline mineral waters are better than plain water. It is a good plan, when circumstances will permit, to prescribe Celestin vichy or Saratoga vichy at proper intervals to secure the proper amount.

Of the remedies that have been advocated for gout, *Colchicum* stands now, as it did one hundred years ago, as the most important. Much abuse has been showered upon this drug, why, it is hard to say, for all prominent authorities are united in its praise. The explanation lies probably in the fact that years ago it was given in larger doses than was necessary; consequently, it did harm. If judgment is used, and the dose is regulated to the needs of the case, no harm can occur. Colchicine itself is probably more convenient for administration; $\frac{1}{100}$ of a grain, three or four times daily, is the proper dose to start with. If it produces any of its well-known symp-

toms the frequency of administration should be reduced. Those who prefer the tincture should give ten minims of the same every two to three hours until relief is obtained or symptoms of physiological action appear. The dose of the wine of Colchicum is eight to fifteen minims. It is advisable to continue the drug for a few days after the subsidence of all symptoms in all cases. In many it is wise to have the patient take it in smaller doses for a week or two, providing it produces no symptoms.

The attack over, the patient should lead the kind of life advocated under the head of prophylaxis.

But Colchicum is not always satisfactory as a curative agent in gout, It sometimes fails. It should succeed, because it is homœopathic to the typical attacks of gout. Hughes* goes very thoroughly into this subject, remarking that many of us have refrained from using Colchicum for no other reason than that it has been extensively used by the old-school. He concludes his argument as follows: "I have dealt thus fully with this point because it is a weak one in our therapeutics, and (as I think) needlessly so; because we make it weak by shrinking from Colchicum, as in another place we are afraid of using Quinine."

*Arnica* will prove useful in a limited number of cases of gout when the characteristic symptoms are soreness of the feet, worse toward evening; a feeling as if the great toe joint had been sprained; inflamed joint, shining red and hard; bed feels too hard; foot feels as if compressed by some hard body.

*Ledum* has frequent clinical relationships to gout. It is indicated when the ball of the great toe is swollen, sore, and painful; drawing pains, worse from warmth, pressure, and motion; gouty nodosities in the joints. When effusion is present it is scanty. The pains are not infrequently associated with chilliness. One great characteristic of Ledum pains is their tendency to travel upwards. A symptom which Lilienthal emphasizes is "œdematous swelling of joint, which may feel cold to the the touch."

*Guaiacum* is indicated for gouty nodosities. Special symptoms include lancinating pains and contractions of limbs, aggravated by slightest motion and accompanied by heat of the affected parts; flatulence; pyrosis; constipation.

There are cases of acute gout in which fever is a prominent symptom. It is then wise to prescribe *Aconite*, either alone or as Hughes recommends in alternation with Colchicum.

When the affected joint is very painful and greatly swollen, and there is intense throbbing, *Belladonna* should be prescribed.

Other remedies which may be used in the course of the acute attacks are *Pulsatilla*, *Lycopodium*, *Rhododendron*, *Colocynth*, and *Sulphur*.

When severe pains in the stomach appear in the course of acute gout

* *Principles and Practice of Homœopathy*, p. 291.

*Nux moschata* is the remedy. It is significant that nutmeg was one of the ingredients in a celebrated prescription for gout in the early part of the past century.

For CHRONIC GOUT, we should select from *Ammonium phos.*, *Calcarea*, *Lycopodium*, *Phosphorus*, and *Aurum.*

**Irregular Gout.**—Simple as is the treatment of acute gout, we encounter a very different proposition when we face cases of irregular gout. Usually, the difficulties arise from the fact that the disease has gone on for years unrecognized. The patient has experienced various diverse ailments, which have been regarded as of local origin and treated accordingly. Finally, when their gouty origin has been determined, secondary changes of organic character have set in, and we find ourselves opposing a case of complicated illness.

In irregular as in typical gout the principal element in the treatment is elimination and the prevention of the accumulation of waste. Elimination is best accomplished by free water drinking. For years it has been customary for gouty patients to frequent this or that spa, drink freely of its water, and returning home in good condition, and ever afterwards sound the praises of the particular spring he visited to the exclusion of all others. As a matter of fact, when we come to study the composition of the waters of the various springs which have had a reputation for the cure of gout, we find the greatest diversities in their chemical composition. Waters containing sulphate of lime, chlorides, sodium sulphate, sodium bicarbonate, arsenic, to say nothing of numerous other ingredients, have all enjoyed high praise. It is reasonable to assume, therefore, that the benefits accruing from a visit to the spas is not dependent upon the chemicals dissolved in the spring water. The treatment at all of them agrees in two very important particulars, namely, large quantities of water are taken daily, and the patient lives a well-regulated life, with freedom from home cares and business worries and away from the temptations to dissipation in the business world. If a gouty patient will but pay attention to himself by leading a hygienic life, and will drink freely of water, especially hot water, at home, he need not resort to the spa treatment. The value of water drinking in gout is expressed by no one better than by Yeo:* "As a diluent and solvent of renal excrementitious substances it is most useful, while in its rapid passage through the system it must dissolve and carry away waste matters from the blood and tissues. When drunk at a higher temperature than that of the blood the effect of this hot water flowing through the hepatic portal circulation is to stimulate the functions of the liver cells and promote biliary excretion. It thus responds fully to the foremost indication in the treatment of gout, *i. e.*, to promote the elimination of waste, while by temporarily diluting the blood it must tend to both favor the solution of uratic deposits and prevent their precipitation.

* *A Manual of Medical Treatment or Clinical Therapeutics*, vol. ii, p. 501.

"The subjects of this diathesis would do well to drink daily a teacupful of hot water on first rising in the morning, another half an hour before dinner, and a third the last thing at night."

The next important question in the treatment of the gouty is that of **diet.** In prescribing in this direction the physician must be guided by the general rules already formulated, namely, the prevention of the accumulation of waste, the promotion of elimination, the maintenance of general nutrition. In furthering one or the other of these objects, the physician should not run counter to the others. The strong, gouty individual of normal build requires an entirely different regimen from those who are obese, emaciated, illy-nourished, nephritic, or emphysematous. Each case must be carefully individualized. In many instances it is the wiser plan to ignore the gout for a time at least and direct one's efforts against the complication. In a general way it may be said that the gouty patient should be limited to meats but once daily, the amount of fat taken should be greatly restricted, and saccharin foods should be prohibited altogether.

For those who wish a specific *menu* to cover the ordinary case of chronic gout, the following by Sir Dyce Duckworth* is submitted: "Six or eight ounces of hot or cold water may be taken half an hour before breakfast. Breakfast should consist of one or two ounces of well-toasted stale bread without butter, grilled fish, grilled mutton chop or beefsteak, or cold chicken, game, beef, tongue or lean ham. One or two small cups of tea or coffee, with a little skimmed milk and without sugar, may be taken. Saccharin may be used as a sweet flavoring agent, but is commonly disliked. Six ounces of bouillon or clear soup may be taken by weakly patients between breakfast and luncheon, and a gluten or almond biscuit with it. For luncheon order cold meat or a poached egg with spinach or lettuce, or other green vegetable, as watercress and mustard and cress, or a small omelet. Crust of bread or hard biscuit in small amount is allowable and a small quantity of fresh butter. A glass of good Bordeaux or Moselle wine (dry) may be taken with as much water. A cup of tea with a little skimmed milk and a rusk or gluten biscuit may be taken in the afternoon. For dinner no soup is to be taken, as a rule, but occasionally about eight ounces of consommé may be allowed, then a little grilled or boiled fish without starchy or fatty sauces, but flavored sometimes with anchovy or other sauce, oysters, or caviare, a little grilled or roasted meat, mutton, game or fowl, with a small proportion of fat, green vegetables, no potatoes, and some stewed fruit flavored with saccharin or made less tart by the addition of half a teaspoonful of Rochelle salt. Two glasses of claret or of a dry Moselle diluted with water are allowable. Later in the evening, a cup of hot weak tea, without milk, or as much hot water should be taken."

It will be noticed that Duckworth advises, or more properly speaking

* Allbutt's *Practice of Medicine.*

permits, mild alcoholic beverages. As a matter of fact, the gouty subject will be better off if he avoids alcoholic liquors altogether. Of course, there are some debilitated patients in whom some alcohol is absolutely necessary. The situation was very well stated by Sydenham: "The old saw is that if you drink wine you will have the gout, if you do not the gout will have you; in other words, while it may be good for the patient it is bad for the disease." It is not so much the kind of wine that is prescribed as it is its quality. Some claret and Moselles are especially bad. If the patient can do without his alcohol so much the better; it simplifies the situation immensely.

Thomas in his diet lists forbids the following:

Rich soups, hard-boiled eggs, fried and made dishes, entrees, pickles, spices, veal, turkey, duck, goose, salmon, lobster, crab, preserved dried and salt meats, salt fish, pickled pork, asparagus, peas, beans, beets, parsnips, turnips, vinegar, tomatoes, mushrooms, truffles, dried fruits, preserves, pies, pastry, rich puddings, patties, new bread, cheese, sweets, omelettes, grapes, pears, plums, strawberries, rhubarb, cider, sweet wines, and malt liquors.

And permits—

*Soups.*—Clear soups, vegetable soups, clam and oyster broths.

*Fish.*—Fresh fish, raw oysters.

*Meats* (to be taken once a day only, white kinds mostly).—Mutton, chicken, ham, bacon, underdone roasts, sweetbread, pigeon, brains, pig's feet, venison, lamb chops, game.

*Eggs* (in moderation).—Whites of eggs, raw, stirred in drinks.

*Farinaceous* (small quantities).—Toast, stale bread, bread from whole wheat, rye bread, milk toast, rice, zwieback, graham gems, graham flakes, rye gems, soup sticks, crackers, hominy, cream of wheat, macaroni, shredded wheat biscuit, granose.

*Vegetables* (fresh green varieties.)—Celery, lettuce, watercress, cucumbers, onions, cabbage, salads, a little baked potato, young peas, string beans, spinach.

*Dessert.*—Oranges, lemons, cranberries, tart apples, apricots, peaches, cherries, jellies, blanc mange, honey, ices (not after meals), stewed or roasted fruit (prepared with but little sugar).

*Beverages.*—Water plentifully, plain soda, milk, buttermilk, zoolak, weak tea or coffee (no sugar), toast-water, lime-juice, lemonade. *Mineral Waters*—Saratoga Vichy, Berkeley, Hot Springs, Va., Lithia Waters, Crab Orchard, Bethesda, Carlsbad, Friedrichshall, Puellna, Villacabras, Marienbad.

*Stimulants* (to be given in exceptional cases only).—Moselle, light Hock, Bordeaux in small quantities and diluted, whisky.

Gouty patients sometimes present some very interesting dietetic prob-

lems by reason of co-existing diseases, as diabetes, interstitial nephritis, acid dyspepsia, and obesity.

The following therapeutic suggestions may be offered for cases of irregular gout:

Occurring in alcoholic subjects, *Nux vomica*, *Calcarea*, *Arsenicum*, *Cinchona*, *Ledum*, and *Pulsatilla*.

In persons who indulge habitually in rich food, *Nux vomica*, *Pulsatilla*, *Antimonium crudum*, *Iodine*, and *Sulphur*.

Involving the head or eyes, *Colocynth*, *Bryonia*, *Kali hyd.*, *Nux vomica*, *Staphisagria*, *Lycopodium*, and *Sepia*.

Involving the stomach, *Antimonium crudum*, *Nux vomica*, *Bryonia*, *Colchicum*, *Lycopodium*, and *Nux moschata*.

Involving the heart, *Aurum*, *Abrotanum*, *Benzoic acid*, *Colchicum*, *Kalmia*, *Lithium carb.*, and *Phosphorus*.

Involving the kidneys, *Benzoic acid*, *Berberis*, *Kali hyd.*, *Sarsaparilla*, *Plumbum*, *Terebinthina*, and *Sulphur*.

**When Gout is Associated with Glycosuria** we cannot, as a rule, enforce the restricted diet we would advise if the latter condition existed alone. It is a good plan, for awhile at least, to pay attention to the gout alone, for if, as sometimes happens, it is the cause of the glycosuria, the latter disappears when we conquer the gout. Sometimes it is a good plan to do what we seldom do in cases of diabetes, place the patient on an exclusive milk diet. In other cases it is the best plan to put the patient on a mixed diet with limitation of the amount of starches and entire restriction of sugars, allowing a limited amount of such bread-stuffs as are the least harmful to the diabetic.

The **Combination of Gout and Nephritis** requires limitation in the amount of nitrogenous food. Meat is permissible, but should be free from fat. If the quantity of albumen in the urine is large, a milk diet is advisable. Alcohol should be prohibited.

**Gouty Acid Dyspepsia** should be treated as we would any other indigestion presenting the same clinical phenomena.

**Gout and Obesity** is a very difficult problem. We cannot give the patient orders to take large quantities of liquids as we do in uncomplicated gout. In a general way, the diet should lean in the direction of that advocated for obesity. Still, we cannot be dogmatic, but must study the patient's idiosyncrasies and reactions to various foods.

## Scurvy.

The overwhelming importance of diet in the prophylaxis and treatment of scurvy has relegated general hygienic measures to the background in the minds of the majority of practitioners. This is certainly unfortunate, for while dietetic management plays the all-important part in the cure of

the disease, it has been demonstrated that all health reducing agencies play an important part in its etiology. To hasten the cure, it is therefore essential that worry, anxiety, bad atmosphere, and overcrowding must be corrected.

At the present day, the numerous agencies necessary to produce scurvy are rarely encountered, excepting under unusual conditions, as in the case of a large army in the field away from its base of supplies. Scurvy on shipboard is now almost unknown, because of the greatly shortened sea-voyages made possible by the use of steam and efficient machinery. Practically, all sea scurvy is observed in connection with Arctic expeditions.

Notwithstanding the fact that our knowledge is sufficient to enable us to prevent and cure scurvy with remarkable skill, we are still in the dark as to the exact manner in which the disease is produced. We know that there is in fresh vegetable food a certain something, the absence of which from the dietary is the efficient cause. Garrod taught that it was the deprivation of the system of the potassium salts, a theory which has much to commend it, but which will not explain all cases. It is therefore useless to attempt to treat or prevent scurvy by the administration of potassium salts. It is otherwise, however, with the prescribing of a line of vegetables rich in this element, as potatoes, spinach, cabbage, sauerkraut, onions, turnips, asparagus, oranges, and fresh vegetables generally. No better directions as to the prevention of scurvy under trying conditions can be given than by detailing Nansen's experience as quoted by Litten.* Nansen based his precautions on the idea that "in long Arctic expeditions, the preservation of meat and fish by salting, smoking, and incomplete drying is insufficient and to be condemned. The main precaution in providing nourishment for a long journey must be to preserve food either by complete and careful dessication or by sterilization by heat. I also attempted to procure not only nourishing and healthy provender but also as great a variety of food as possible. We took with us meat of all kinds in hermetically-sealed tins ; fish, both dried and preserved ; potatoes, both dried and in cans ; all kinds of preserved and dried vegetables, boiled and dried fruit, preserves and marmalade in large quantities, also condensed milk with and without sugar ; preserved butter, dried soups of various kinds, and many other things. Our bread was chiefly Norwegian ship bread made from rye and wheat, and English ship biscuit. In addition, we took flour in order to be able to bake our own bread. Each article was chemically examined before it was accepted, and especial attention was given to the packing ; even the bread and dried vegetables were soldered into zinc-lined cases. Our beverages for breakfast and supper were chocolate, coffee, and tea, and occasionally milk ; at dinner we had beer in the first half year ; later, we had lemon juice with

* Nothnagel's *Encyclopædia. Diseases of the Kidneys and of the Spleen, Hæmorrhagic Diseases*, p. 712.

sugar and syrup. In addition, all arrangements were made for a comfortable mode of living aboard ship; the living- and sleeping-rooms were warm and there was a plentiful supply of clothing, a well-stocked library and a number of musical instruments, so that life never became monotonous."

From the above it will be seen that Nansen regarded variety in food as a very important matter. This point has not been dwelled upon sufficiently by authorities. It has usually been the custom to look upon a plentiful supply of lemon- and lime-juice as all-sufficient. While these are invaluable, we must not overlook the importance of fresh foods of all kinds.

A supply of good drinking water is necessary. In Arctic expeditions this has usually been obtained from sea water by distillation. Nansen recommended the use of salt-water ice which protruded above the sea, "because these parts have been exposed to the rays of the sun the greater part of the summer and have lost the larger portion of their salt."

To the general medical man, the prophylaxis of scurvy has its main bearing on the management of almshouses, prisons, and other institutions where many people are more or less crowded together under economical management. The inmates of these institutions are usually broken down in health, and furnish a favorable soil for the operation of the exciting causes of scurvy. Medical men and managers attached to institutions should make it a point that the diet of those entrusted to their care is sufficiently varied and contains a proper proportion of fresh meats and vegetables.

The curative treatment of scurvy, like the prophylaxis, relates mainly to the diet, although some few cases have been cured by removal to hygienic surroundings alone. The articles to be prescribed include lemon- and lime-juice, fresh meat and vegetables, fruits, milk, and beef tea. In the treatment of each individual case one must regulate the character and quantity of food to the condition of the digestive apparatus. In all cases, it is wise to prescribe the juice from two to four lemons daily. When the digestive tract is in bad condition the only food that can be taken with safety is raw milk and freshly-made beef tea or broth. In still other cases chopped or scraped beef is an invaluable article of diet. In less severe cases, or when the stomach will permit, a full line of fresh fruit and vegetables may be prescribed, the precaution to avoid gormandizing having been enjoined on the patient or attendants.

The mouth demands careful attention in every case. The measures for its care are those described in the section on the treatment of ulcerative stomatitis.

Remedies play a very subordinate part in the cure of scurvy. Indeed, it may be said that they can accomplish nothing if the dietetic management is neglected. All that we can expect of them is that they will assist in

building up the patient's constitution so that recovery may be hastened thereby. For the constitutional symptoms the mineral acids are better adapted than any other remedies. *Muriatic acid* is indicated by the profound prostration, the feeble heart, and the stomatitis. *Nitric acid* is the better remedy when the ulcerations of the mouth are the predominant condition; *Sulphuric acid* for the hæmorrhages.

Besides the above, hæmorrhagic cases call for *Phosphorus*, *Hamamelis*, *Ipecac*, *Cinchona*, *Secale*, *Terebinthina*, and *Ferrum phos.*

General prostration and weak circulation, *Crotalus*, *Lachesis*, and *Arsenic.*

For hæmatemesis, *Hydrastinine hydrochlorate*, *Secale*, *Hamamelis*, and *Ipecac.*

For hæmaturia, *Hydrangea*, *Berberis*, *Chimaphila*, *Terebinthina*, *Uva ursi*, and *Sabul serrulata.*

## Scurvy in Infants.

Scurvy during infantile life is the product of superfluous and unwise care in following out pseudo-scientific methods of infant feeding. Briefly stated, the disease is due to the preparing of milk in such a way that a certain something in its composition, which is capable of preventing scurvy, is driven out of it. That "something" is necessary to the nutrition of the infant. If, therefore, the little patient is deprived of fresh milk for a prolonged period ill-health supervenes, and if the cause of the trouble is not corrected a clinical condition which we now recognize as scorbutus develops. I feel that I must speak strongly concerning the many follies of infantile feeding. Infantile scurvy is practically a disease of well-to-do families, who have the means and facilities for preparing milk until it no longer resembles the original article. The worst case of the disease ever coming under my care was brought about by long-continued subsistence upon Pasteurized milk. Previous attendants, by reason of the many and alarming symptoms, mostly of a hæmorrhagic character, had treated the case as one of congenital syphilis. Two-thirds of the cases are directly traceable to an exclusive diet of one or the other of the proprietary foods, especially of those which, according to directions, are to be administered without any admixture of fresh milk. The remaining cases have been due mostly to condensed or sterilized milk.

The treatment of infantile scurvy is a very simple matter. It consists of a change of food to fresh milk, which must not be heated to excess. In addition, the patient should be given lemon or other fruit juices, scraped apple, pulp of grapes, etc. In the cases of older infants, we may prescribe with advantage baked potatoes, which may be mixed with fresh milk to the consistence of a mush. In younger infants, a couple of teaspoonfuls of this mixture may be added to each bottle of milk.

## Rachitis.

(*Rickets.*)

While rachitis is not *per se* a dangerous disease in that the vast majority of cases make ultimate recoveries, its management is of the greatest importance because of its great liability to produce permanent deformities, and the frequency with which intercurrent affections, as bronchitis and pneumonia, take place. It is also a well-attested fact that it predisposes to affections of the nervous system, Gowers making the positive statement that 10 per cent. of cases of epilepsy give a history of rachitis in infancy. With such handicaps for the rachitic patient it behooves us to give its hygienic management and medicinal treatment the most serious consideration.

Underlying the principles of its treatment is a proper understanding of the etiology of the disease. Unfortunately, we are unable to state in a positive manner the influence exerted by numerous factors in the production of rachitis. We know that special conditions do exert some causative influence, but to what extent authorities are by no means agreed.

Unquestionably, improper nourishment stands first among the active causes of the disease. But here again we are met with certain contradictions. It has been shown that bottle-fed infants are its most frequent victims. This seems to be due to the insufficient fats which are given such patients, together with the frequent administration of carbohydrates. The carbohydrates have been accused of being active causes, in that it has been observed that rachitis has occurred frequently in infants who have taken the normal quantity of fats. It is reasonable to suppose that the consumption of starchs and sugars so interferes with digestion as to impair the metabolic processes. Only less harmful than the carbohydrates are an exclusive diet of condensed milk and the numerous proprietary foods (usually given improperly and without judgment). When breast-fed infants become rachitic it is because of some defect of the mother's milk. Usually, we find that the child has been kept on the breast for a too prolonged period, with the idea of maintaining lactation as a preventive of pregnancy. In arranging the diet of the rachitic patient it should be our object to increase the fats to the highest point consistent with the patient's digestive functions. This may be accomplished by increasing the quantity of cream in the percentage feeding and the administration of cod liver oil ; at the same time, the carbohydrates should be reduced to a minimum. An advantageous way of administering fat to infants who have reached the age of 12 months is a soft-boiled yolk of egg once daily. The starches even may be cut off entirely with advantage. In some few cases even such a simple diluent as barley water is harmful. Sugar is necessary to sweeten the food, but no more than is necessary should be administered.

Forchheimer is very emphatic in his recommendation that salt be added

to the patient's food, and quotes Zeifel to the effect that in Saxony rachitis has been produced by a deficiency of salt in the bread. He furthermore refers to the fondness of rachitic children for salt.

But little account need be taken of heredity *per se*. When rachitis occurs in families it is usually the result of all members being subjected to the same pernicious diet and general bad hygiene. The occurrence of one case in a family should, however, be a warning to parents to exercise every precaution as to the feeding of subsequent children.

Bad hygienic surroundings, especially poor ventilation, lack of sunshine, and overcrowding are not necessary causes of rachitis. At the same time, they are effective agencies in making the generally accepted real cause—the deficiency of fat and excess of carbohydrates—active. Hence, patients should be taken out-of-doors for several hours daily. When financial conditions will permit, they should be removed to the seashore or country. When this is impossible, those of straightened circumstances can nearly always avail themselves of the opportunities afforded by cheap steamboat excursions or special reduced rate trips into the country.

When possible, also, those who reside in damp houses, where ventilation is poor and the dwellings overcrowded, should be induced to move into more commodious quarters.

Parrot's theory that rachitis is a frequent result of hereditary syphilis is no longer accepted as authoritative, the only influence that infection can exert being that of reducing constitutional resistance to disease in general. Hence it is that antisyphilitic medication is rarely, if ever, to be considered as a factor in the treatment of rachitis.

One of the serious problems, if, indeed, it is not the most important, is the prevention of bony deformities. This can usually be solved satisfactorily by postural treatment varied according to the demands of individual cases. The most commonly observed deformities are those of the lower extremities. These may be avoided entirely, as a rule, by keeping the little one off his feet and preventing such constrained positions as sitting cross-legged. It may be considered a good rule to forbid standing or walking until the general treatment has been in force for three months. although there are some who advocate less stringent instructions, and advise that the child be permitted to go about in moderation as soon as the active symptoms of the disease, *e. g.*, the sweating, the delayed dentition, the pains, and impaired physical activity, are greatly relieved, showing that the progress of the pathological changes has been checked.

Careful watch should be exercised over the spine, although in the majority of cases the resulting curvatures disappear in time. If kyphosis or lateral curvature be observed, even in the slightest degree, the patient must not be permitted to sit up, but must be forced to lie on a hard bed without a pillow under the head. If it should be deemed advisable to permit a sit-

ting posture, the back should be well supported, the shoulders being kept well back. It is also a good plan to keep the child for a few minutes each day in a prone position. When the above instructions are impossible of enforcement, as they sometimes are, the child should be fitted to a plaster-of-Paris jacket.

The deformities of the chest can only be prevented by care in picking up the child. The usual custom of grasping it under the arms or compressing the chest is bad. It should always be lifted from below. The cure of chest deformities is practically impossible. Respiratory gymnastics of various kinds have been advised. Authorities are by no means agreed upon the best. One advises rarefied air, and another compressed air. With such notorious disagreement it can hardly be possible that alterations in atmospheric pressure can have any beneficial influence.

Fortunately, there is a natural tendency for the deformities of mild degree to disappear of themselves when recovery from the disease takes place. If this much desired result is not attained, the advice of a competent orthopædist should be secured. To the general practitioner the problem may seem a very simple one; and yet it is astonishing to note the improvement following advice by those of larger experience in the management of deformities.

The theory that rachitis is due to a deficient supply of lime to the bones is no longer entertained seriously, and yet it is not uncommon to find the various lime compounds with phosphorus prescribed. The deficiency of lime in the bones is due to faulty metabolism and not to imperfect supply. Fill the body as we will with lime the requisite quantity will not be absorbed. Hence, such preparations as phosphate, lacto-phosphate, and hypo-phosphite of lime are utterly useless and waste valuable time, to say nothing of taking attention from the real curative measure—the supplying of fats and the cutting off of carbohydrates.

**Remedies.**—*Phosphorus* is universally admitted to be the most frequently indicated remedy in rachitis. Old-school authorities likewise admit its value, but differ greatly in their views as to the rationale of its action. Kassowitz, as quoted by Raue,* "has been able to demonstrate that Phosphorus exerts a specific selective action upon the epiphyses of long bones, inducing an inflammation process of the bone-forming cartilage at this point, thus presenting the strongest resemblance to the rachitic process. On the strength of this, he was the originator of the phosphortherapie in rickets, being championed by such pædiatrists as Demme, Soltmann, Jacobi and others." This approach to homœopathy on the part of one of their number has not satisfied other old-school authorities, some of whom have denied that it has any influence whatever on the rachitic process, while still others assert that histological investigations prove that the changes in rachitis are

* *Diseases of Children*, second edition, p. 582.

the direct opposite of those produced by Phosphorus. The usual dose of the drug is $\frac{1}{200}$ of a grain disssolved in cod liver oil, administered three times daily. The difficulty with those who have condemned Phosphorus lies in the fact that it is not a specific and does not cure all cases. It is especially adapted to cases in which the nervous phenomena predominate, and for the respiratory symptoms. The assertion that the benefit produced by Phosphorus is due entirely to the simultaneous administration of cod liver oil is not borne out by facts, for Mandelstamm had equally good results whether the drug was given with cod liver oil or otherwise.

The various salts of Phosphorus are frequently useful. *Calcarea phosphorica* is indicated in children with defective nutrition, especially if emaciated and with sunken, flabby abdominal walls. The fontanelles are unnaturally large; dentition is delayed; the cranial bones are unnaturally thin and brittle. Diarrhœa is present, the stools being greenish, and consisting in part of undigested curd, fat, and mucus. It is the leading remedy in those cases in which there are well-defined pains in the joints.

*Calcarea ostrearum* is indicated by constitutional symptoms, namely, the fat flabby development, the large or swollen abdomen, and enlargement of the cervical lymphatics. It is especially useful in cases presenting a whitish, frothy diarrhœa, rachitic deformities of the thorax, swelling of joints, perspiring during sleep, but especially about the head and neck, and pungent odor of the urine.

*Ferrum phosphoricum* is an invaluable remedy in cases presenting anæmia as a prominent feature and subject to frequent intercurrent attacks of bronchitis.

*Phosphoric acid* has as its chief indication a remarkable debility associated with marked apathy and indifference. There are ofttimes associated with this a painless diarrhœa or a painless enlargement of the lymphatic glands. It also seems to be the remedy for those cases which have been described as "scurvy-rickets."

*Silicea* is indicated in constitutional factors only. These include the following: Head disproportionately large; fontanelles, especially the anterior, unusually open; child small and emaciated, with the exception of the abdomen, which is large; the head is covered with an offensive sweat; face pale, earthy or yellowish; swelling of the epiphyses of bones; skin dry and scaly.

Other remedies of use in rachitis include *Calcarea fluorica*, *Belladonna*, *Mercurius*, *Kali hydriodicum*, *Aurum muriaticum*, *Magnesium mur.*, *Sulphur*, *Alumina*, *Kali mur.*, *Kali phos*,, *Cinchona*, *Picric acid*, *Baryta carb.*, *Cypridol*, *Hepar*, *Staphisagria*, *Mezereum*, and *Theridion*.

# CHAPTER III.

## DISEASES DUE TO ANIMAL PARASITES.

### Ascariasis.

The important parasites belonging to the *Ascaridæ* are the *Ascaris lumbricoides* and the *Oxyuris vermicularis*. The *Toxicara canis* also belongs to this group, but is very uncommon in man. It is very common in dogs and cats.

**Ascaris Lumbricoides.**—The prophylaxis of Ascariasis appears to be almost impossible of solution in view of the probable factors in the dissemination of the parasite. The eggs are known to escape in the fæces of infected individuals, and it has been *proven* that ordinary house-flies, which have been permitted to feed on such offal, harbor these eggs in their intestinal tracts. Is it necessary to say more? We know the unfortunate habits flies have of alighting on everything clean and unclean, and how they travel from privies to dining-rooms. The marvel is that they do not do more damage than they are already credited with. Ascariasis is also transmitted, it is believed, by impure water, and vegetables and fruits which have been exposed to fæcal infection.

The treatment of Ascariasis is very satisfactory. We have in *Santonine* a remedy which is almost certain to expel the parasite. The daily dose for an adult is one to five grains. For children it is one-sixth of a grain for each year of the child's age. The preferable preparation is the crystals and not the powder. Physicians may also use the compressed or tablet triturates of Santonine. Hare warns against the use of the *Santoninate of sodium*, which is a soluble drug readily absorbed, and therefore is just what a vermifuge should not be. The same author presents the following formula for troches of Santonine for the use of such physicians as wish to write prescription for the troches instead of ordering the officinal *Trochisci Santonini*.

| | |
|---|---|
| Santonini, | gr. v. |
| Pulv. sacchari alb., | ʒiij. |
| Pulv. acaciæ, | gr. viij. |

*Misce bene et adde.*

| | |
|---|---|
| Acaciæ mucilag., | gtt. xvj. |
| Aquæ, | q.s. |

Ft. in troches No. X.

S.—One or two lozenges as directed.

The good result will be made more certain if the patient is put on a

spare diet of food, which gives but little fæcal residue, for a couple of days preceding the administration of the anthelmintic.

Parents or family should be cautioned concerning the occasional untoward effect of *Santonine* on the eyes, *i.e.*, yellow vision.

It is always wise to follow up the vermifuge with a dose of Calomel. To insure the expulsion of all the eggs, the drug should be repeated daily for two or three days, and then every third or fourth day until examination of the fæces shows the entire absence of parasites and ova.

Other vermifuges recommended for the Ascaris include fluid extract of *Spigelia*, *Oil of Chenopodium*, and *Senna*. These are, however, rarely used in practice owing to the efficiency of the Santonine.

**Oxyuriasis.**—The *Oxyuris vermicularis* or *pin-worm* is probably the most frequently encountered intestinal parasite, and especially so in children. Infection is believed to take place by contaminated food, or from others who harbor the parasite. The latter is an important source of infection, because the worms have the power of escaping from the anus, whence they may soil the bed-clothing. This peculiarity also makes reinfection of frequent occurrence. This worm produces intense itching at the anus. The patient, through scratching, infects the fingers beneath the finger-nails, and so contaminates any food he may handle. It has been very properly suggested that infection may take place through the medium of flies—a very plausible suggestion in view of the fact that infants at the breast are by no means free of the parasite.

Successful treatment of oxyuriasis demands perseverance, for we have to deal not only with the mature parasite in the rectum but the younger ones which inhabit the small intestine. The expulsion of the worms in the rectum is readily accomplished by injections of infusion of *Quassia* or of *strong salt solution*. These should be repeated nightly until all symptoms of worms have disappeared. It is a good plan to follow the escape of the enemata by anointing the anus and perineum with a thin layer of cosmolin.

The Quassia infusion is prepared from one ounce of ground Quassia wood in one pint of water.

Jacobi recommends rectal injections of *water and vinegar* in the proportion of one to three. This mixture should be boiled before using, as it is possible to create by it a vinegar eel infection.

The expulsion of the parasite in the small intestines is usually a very difficult matter. No better treatment than the administration of *Santonine* and *Calomel*, as recommended for Ascaris lumbricoides, can be proposed.

Sometimes the Oxyuris wanders into the vagina and produces a high grade of catarrhal inflammation. Occasionally, the accompanying irritation may lead to masturbation through the necessary scratching of the parts. Such cases must be treated locally by simple cleansing injections.

## Tæniasis.

(*Tape-worm disease.*)

While the general problem involved in the treatment of patients who harbor tape-worms is practically identical in all cases, nevertheless there are some important facts connected with the prophylaxis of the several varieties which demand that physicians should make accurate diagnoses of the particular species which infests his patient. Of the many varieties of tænia, the beef tape-worm—**Tænia saginata**—is the most common in the United States and Canada. It is spread entirely by animals which have become infected through careless disposal of the fæces of individuals who harbor the parasite. It is readily prevented by thorough cooking or salting of infected meats; or by keeping beef in cold-storage for at least three weeks after killing. Usually, but one worm is present in a patient, though as many as 59 have been reported as occurring in a single case.

The **Pork Tape-Worm—Tænia solium**—at one time believed to be of common occurrence in this country, is in reality very rarely observed. Its incidence is a much more serious matter than is that of the tænia saginata, because of its liability to produce cysticercosis. It is of the greatest importance that it should be treated promptly when diagnosed. No such excuse as pregnancy or convenience of physician or patient should permit of even a day's delay. Pork tape-worm infection is produced by eating raw or badly cooked pork. Hogs are infected by eating fæces or contaminated food and water containing the eggs. Prophylaxis consists of proper disposal of human excreta, and the thorough cooking of contaminated pork. Cold-storage, though of some value, is by no means as efficient a preventive as in the case of the tænia saginata.

**The Dwarf Tape-Worm—Hymenolepis nana**—is the smallest of the tape-worms, and is believed to be transmitted to man by food infected by rats and mice. A number of cases have been reported in Virginia, Florida, and Washington, while in Sicily it is claimed that 10 per cent. of the children are infected. Prophylaxis demands that food shall be thoroughly protected from contamination by rats and mice. Infected individuals should be made to occupy separate beds until cured.

**The Broad Tape-Worm—Dibothriocephalus latus**—is due to the eating of raw or insufficiently cooked fish. Its prevention depends upon the maintenance of a pure water supply and the thorough cooking of fish.

**Treatment.**—The measures for the removal of tape-worms must be instituted promptly upon the discovery of the presence of the parasites. Such action is important not only because of the health of the sufferer, but also on account of the danger of spreading infection by the stools, as long as the tape-worm lives and lays its eggs. Exception to the above peremp-

tory advice may be permitted in the case of pregnant women or in persons suffering from acute disease. Business engagements may at times be regarded as sufficient justification for postponement of treatment. On the other hand, when it is known that the parasite is the tænia solium no excuse for delay should be considered, because of the danger of this variety of tape-worm infecting the entire system with cysticercosis.

The majority of the failures in the treatment of tæniasis result from lack of attention to preparatory details. The necessary measures involve considerable discomfort, and at times weaken the patients. It is essential, therefore, that the patient be ordered to bed, and, better still, placed in hospital, or under the supervision of a nurse. To those who have been accustomed to giving tænicides in a hap-hazard sort of way this advice may seem superfluous, but when one becomes aware of the numerous failures he cannot fail to realize that attention to details pays for the trouble and inconvenience incurred.

The principles involved in the treatment of tæniasis may be epitomized as follows :

1. The bowels should contain as little contents as possible, so that the vermifuge may act upon the parasite.

2. A reliable tænicide should be selected, and care should be taken that fresh preparations of the drug be administered.

3. Careful attention should be given to the administration of purges and other details.

4. The worm must be carefully examined to determine that the head has passed, for should the latter fail to appear the parasite will continue its growth.

To fulfill the above indications, the patient should be put through the following course of treatment.

1. **Preparatory Treatment.**—This should be carried on over a period of two or three days, during which time the patient is placed upon a diet which shall leave as little fæcal residue as possible. The foods to be ordered include milk, broths, eggs, etc., and in sparing quantities. As the patient is necessarily weakened by this semi-starvation, it will prove the part of wisdom to have him remain in bed. It is also important that the patient be given some mild laxative the evening preceding the administration of the tænicide. Compound licorice powder and sulphate of soda have been especially recommended for this purpose. On the morning for giving the tænicide the bowels should be still further emptied by the administration of a full enema of soap and water or saline solution. The object of this preliminary treatment is to rid the bowels so thoroughly of fæcal materials that the tænicide can act upon the worm.

2. **Administration of the Tænicide.**—As all of the drugs capable of expelling tape-worms may produce very disagreeable and at times

alarming symptoms, as fainting, vertigo, etc., it is absolutely essential that the order that the patient remain in bed shall be peremptorily enforced.

No food whatever should be given on the morning for the administration of the tænifuge.

Any of the following drugs may be used for expelling the worm:

*Filix Mas.—Aspidium; male fern.*—This is unquestionably one of the most reliable of the anthelmintics, but is open to the objection of producing poisoning symptoms when given carelessly or in overdoses. The best preparation is the oleoresin. It is especially important that the preparation prescribed shall be fresh. The dose should be from one-half to one drachm for an adult patient, and is best administered in capsules. Hare recommends the following formula:

| | | |
|---|---|---|
| Oleoresin. aspidii, | | |
| Tinc. vanillæ, . . . . . | āā | m. xlv. |
| Pulv. acaciæ, . . . . . | | ʒss. |
| Aquæ destillata, . . . . . | | fl ʒj. |

S.—Take the entire amount at one dose after fasting.

Some authors advise doses as large as two drachms, but such should be regarded as the limit of safety, and should never be repeated. In from thirty minutes to one hour after taking the drug a purge of magnesium sulphate or calomel should be administered. Under no circumstances should castor oil be prescribed after Filix mas, as it increases the absorption of the drug and the possibility of poisoning.

*Pelletierine*, which is an alkaloid derived from the *Pomegranate root*, is generally regarded as efficient as Filix mas. The main objection to it is its expense. As with the latter drug, it is highly important that we use an absolutely fresh preparation. The dose is from three to five grains in capsules.

If we use the *Pomegranate root*, we take one and two-thirds ounces of the same and macerate it for twenty-four hours in one pint of water. It should then be boiled down to one-half pint and made palatable by the addition of one fluid ounce of syrup of orange peel. The whole quantity should be taken in two doses.

All of the Pomegranate preparations should be followed by a brisk purge.

*Pumpkin seed, Cucurbita pepo*, is likewise a reliable tænicide. Its great advantage lies in its absolute safety; hence, *it is the drug to be used by preference in the case of children.* Two ounces of the seed are decorticated and well rubbed up into a mixture with sugar.

3. **Expulsion of the Worm.**—With the desire for stool, the patient should use a commode with a vessel containing warm water. Cold water is said to cause sudden contraction of the worm, which may lead to its breaking. The defecating into water is important, in that it causes a very

ready separation of the fæces and the segments of the worm. The patient should take time at stool, and under no circumstances endeavor to hurry up things by pulling on the worm.

All stools should be saved for the inspection of the physician in order that he may determine whether or not the head has been passed.

If the head is not found, it is fair to presume that there will be a recurrence, but inasmuch as the renewed growth takes several months, subsequent treatment may be deferred until such time as the appearance of tape-worm segments in the stools acquaint the sufferer with his condition.

## Trichiniasis.

This is infection with the *Trichina spiralis*. Its occurrence in man is due almost exclusively to the eating of raw pork. Hogs become infected through eating uncooked swill and the refuse of slaughter houses. Rats are also the victims of the disease, obtaining their infection from butcher shops or from devouring each other.

Trichiniasis is an entirely unnecessary disease, as it cannot possibly occur, even though diseased meat be eaten, if care be taken that it is properly cooked. Germans, however, will insist upon eating raw pork; hence, epidemics of trichiniasis are of occasional occurrence.

Systematic meat inspection is an inefficient preventive, for it can never be so thorough as to make it certain that the meat is sound. Such inspection is exceedingly costly, and as it gives a false sense of security is apt to lead to careless eating habits. Thorough curing of the pork according to American methods is believed to be a sure preventive.

When circumstances suggest that patients have partaken of what is generally known as "measly pork," energetic treatment should be instituted. This includes, first, the thorough washing out of the stomach. Following this, the patient should be purged, Calomel being the drug which will give the most satisfactory results. This treatment cannot be expected to do more than reduce the intensity of the infection, for certain of the parasites will eventually invade the muscular tissues.

When the disease has reached the latter stage, nothing can be done in the way of destroying the parasites. The symptoms are then strongly suggestive of typhoid fever, with which many cases have been confounded. Our therapeutic measures must then be carried out on a symptomatic basis, and the patient given good supportive treatment. The severe muscular pains call for special consideration. If they fail of relief from hot baths we are obliged to prescribe Morphia.

Trichiniasis is a serious disease, the mortality ranging in various epidemics from 5 to 100 per cent.

## Trypanosomiasis.

(*Nagana or tsetse fly disease; African sleeping sickness; Senegambia fever.*)

Experimental and clinical evidence has demonstrated beyond dispute that infection by the Trypanosomes is carried by the tsetse fly, the habits of which have been well studied by Bruce and others. These insects are found almost exclusively in dense forests, and especially along lake shores. They rarely, if ever, infest localities where ground is under cultivation.

Observation has shown that whites are very rarely affected, a fact for which a very plausible explanation has been given. The black race go around practically naked, and are in the habit of lying around and sleeping on the shores of the lakes, and pay little or no attention to the fly-nuisance. The whites, on the other hand, are better clothed, and resent the visitation of flies.

The statement that Trypanosmiasis is invariably fatal cannot be successfully contradicted, for cases must be under observation a number of years in order to prove such statement to be a fact. It has been demonstrated, however, that much can be done in the way of palliation and causing the disappearance of the parasite from the blood by relatively large medicinal doses of *Arsenious acid* (gr. $\frac{1}{6}$ to gr. $\frac{1}{3}$ daily). Ultimately, however, the symptoms return, and again they may be caused to disappear. Ehrlich has made some experiments with aniline dyes which give some promise of attaining the successful result. The one particularly recommended by him is *Trypanroth*. *Malachite green* has also been suggested.

The importance of the discovery of a cure for the sleeping sickness cannot be overestimated. To us in this country, it appears to be of little importance; but when one considers that in Africa over 100,000 negroes die of it annually the importance of the discovery of a specific which shall kill the protozoa in the blood will be appreciated.

## Distomiasis.

(*Distomatosis; fluke infection.*)

Fluke infection occurs almost exclusively in Japan, China, Formosa, Korea, and the Philippines. Although the existence of this parasite has been known for many years, we have no accurate knowledge of the way by which man is infected by it. Prophylactic measures can be formulated on general principles only. In infected districts the inhabitants should take special care of their water-supply, and drink only that which has been boiled or filtered. Special care should be taken in the preparation of foods taken from water, *e. g.*, snails and fish, the former in particular having been accused by some authorities of carrying the infection.

We recognize four clinical varieties of fluke infection, as follows:

1. Pulmonary distomiasis.
2. Hepatic distomiasis.
3. Intestinal distomiasis.
4. Venal distomiasis.

From each of these we may have secondary varieties developed, as cerebral from the pulmonary, intestinal from the hepatic, and ophthalmic from the hepatic.

Each variety demands its own specific measures designed to prevent the transmission of the infection to the healthy. Thus, in the case of pulmonary distomiasis, which is characterized by profuse hæmoptysis, it is of the highest importance that all sputum be thoroughly disinfected before throwing it away; in the intestinal and hepatic varieties the stools demand careful attention.

Inasmuch as the lower animals, especially cats and dogs, are frequently the victims of the disease, all of them believed to harbor the parasite should be killed and their bodies burned.

Very little can be said concerning the treatment of the developed infection. Removal of the patient to a locality free from the parasite is about all that we can recommend. This, of course, does not cure, but it lessens the chances for additional infection.

**Bilharziosis,** the blood fluke infection, also known as *Egyptian hæmaturia*, *endemic hæmaturia*, and *bilharzia disease*, is found in certain parts of Asia, Africa, Panama, Cuba, and Porto Rico. There is very good reason for believing that infection takes place by way of the skin. Mild infections do not seem to be very serious in their results. The danger seems to lie in reinfections and complications.

Prophylaxis demands that special care should be taken of the urine of bilharzia patients.

Treatment of the developed disease must be largely symptomatic. We have no specific which will destroy the parasite, although *Methylene blue* has had its advocates.

Most of the clinical manifestations of the disease relate to the bladder and rectum; hence, these organs should receive special attention. Conservatism should be exercised in operating on the bladder, radical treatment being deferred until the patient's sufferings make it absolutely necessary.

Preparations of *Male Fern* have been recommended for the hæmaturia, and should be tried in the absence of any remedies offering greater promise.

## Filariasis.

There are three varieties of the Filaria infecting man, namely, the Filaria nocturna, Filaria diurna, and the Filaria perstans. We may add to this list the Filaria loa, the clinical history of infection from which and the treatment thereof are very different from the other varieties of Filariasis.

The ordinary Filariasis produces a number of symptoms which have been described under the headings of hæmatochyluria, elephantiasis, and disturbance of the lymph channels and glands.

The infection occurs almost exclusively in tropical and sub-tropical Asia, Africa, and America, but is especially common in Southern China, India, Samoa, Friendly Islands, and the West Indies. Infection takes place almost, if not exclusively, by the bite of the mosquito. The idea that it occurs through the drinking of infected water has been definitely abandoned.

The lymph varices are observed with especial frequency in the groins. As a rule, it is the best plan to pay no attention to them, unless the discomfort produced by them is such as to disable the patient. Operation is then our only recourse, but the results from the same are not at all satisfactory, as it is not infrequently followed by lymphorrhagia. Godlee, in one case, drained the lymphatics into the vena spermatica and vena saphena with good result.

Chyluria is due to the rupture of lymphatic varices in the bladder-walls. The treatment is largely expectant. The patient should be kept at absolute rest in bed. The diet should be restricted in quantity and fats should be forbidden entirely. Gentle vesical irrigation is regarded as of some value by a few physicians; still, those with the most experience are content with enforcing rest and the dietetic precautions above outlined.

**Elephantiasis,** when of disabling size, requires surgical treatment.

**Lymphangitis** of the extremities demands that the affected part be kept in an elevated position, and local applications of the ice-bag.

Drugs to kill the parasites in the blood have not given good results. Indeed, it has been claimed by some that the dead filaria are more dangerous than when alive. Flint and Zellweger have used *Methylene blue* in doses of one grain every four hours in a few cases and have reported good results.

Prophylaxis, therefore, is the only reliable treatment. With this in mind, patients suffering from Filariasis should be forced to sleep under mosquito-netting in order that mosquitoes shall not become carriers of the disease. If this were consistently and persistently done Filariasis would become a disease of the past.

**Filaria Loa.**—Infection by this parasite is believed by Manson to take place through the mangrove fly. The worm infests the superficial connective tissue in various portions of the body, especially around the eyes. The approach of the parasite to the surface is readily seen. When this fortunate event occurs the parasite is seized through the overlying parts with a pair of forceps, an incision is made, after which a second pair of forceps grasps the worm and extracts it.

## Dracunculosis.

(*Medina worm; Guinea worm infection; filaria dracunculus.*)

Dracunculosis is essentially an old-world infection, being found especially along the West Coast of Africa from Senegal to Cape Lopez, India, Turkestan, and the Fiji Islands. In America it has established a firm footing in Curacoa, Demerara, Surinam and some portions of Brazil.

It seems to have been pretty well established that infection takes place through the drinking of polluted water, though there is some evidence which seems to show the possibility of the worms penetrating the skin of bathers or men working in ditches, etc.

Prophylaxis demands that in infected districts the inhabitants drink only water that has been boiled or filtered. Inasmuch as the vesicles often invade the hands, patients should never do any washing of themselves or utensils in water that forms part of a drinking supply of a community.

The recommendation that the worm be gradually extracted is not to be regarded as sound advice, for it may rupture, in which case the uterus is emptied of its embryos, which escape into the surrounding tissues, excite a severe grade of inflammation, and even periostitis and septicæmia.

Injections of bichloride solution of 1:1,000 into the tissues, or if the worm protrudes, into it direct, have been found to be efficient. Other remedies include the injection into the worm of alcohol colored with fuchsin; packing of the sinuses with cotton saturated in pure carbolic acid, and slitting up of the sinus followed by dressings of carbolic acid solution in the proportion of 1:15.

## Anchylostomiasis.

(*Uncinariasis; Porto Rican anæmia; ground itch; Egyptian chlorosis; St. Gothard tunnel disease; miners' anæmia; miners' cachexia; hookworm disease.*)

As much of our knowledge respecting Uncinariasis has been acquired since the publication of my work on Diagnosis, a few words concerning the clinical aspects of this infection are in order. The existence of a form of anæmia dependent upon infection by the anchylostomum duodenale has been known for a number of years, but it was generally believed that the disease was confined to the old country and to certain tropical regions. Investigations made by the Porto Rican commission of the many cases of anæmia occurring in that country have demonstrated most conclusively that we have a "new country hookworm," and that numerous cases have occurred in the Southern States, and even some few infections in the mines of Pennsylvania. Clinically, uncinariasis is characterized by a high grade of anæmia. The diagnosis is based upon the examination of the stools. Microscopically, we find the eggs of the parasite, or if, as is not uncommonly the case in mining districts, such a method of examination is impracticable or not available, we

may apply the blotting-paper test as described by Stiles: "Fold an ounce or so of the fæces in filter paper and allow it to stand for several hours, then unwrap and examine for a blood stain." The test is not to be regarded as authoritative, but of value when those of more certain character are not at hand. Stiles himself says that he has found it invaluable in a number of cases when a microscope was not available.

For many years it was believed that infection took place only by way of the mouth. It now seems to have been pretty conclusively demonstrated that its main source is by way of the skin, the infection occurring almost exclusively among those who go barefooted and walk in contaminated earth.

The disease is spread entirely by the careless disposal of the fæces of infected individuals. Its prevention is therefore an easy matter, namely, the erection of suitable privies and furnishing proper places for defecation in the mines. The wearing of shoes and the drinking only of boiled water are matters of personal hygiene, which cannot be enforced by health boards or employers owing to the poverty of the communities.

Fortunately, we have a very efficient remedy for the cure of Uncinariasis, namely, *Thymol*. On the night before the drug is to be taken the patient should be given a full dose of magnesium or sodium sulphate as a purge. This clears out the bowels, and makes the action of the anthelmintic upon the parasites more certain. Early the following morning the patient is given 30 grains of Thymol in capsules; a second dose of like size is administered two hours later, after which the *saline* purge of the night before should be repeated. Under no circumstances should Castor oil be given, as this, like other oils, dissolves the Thymol, and thereby causes poisoning symptoms from absorption of that drug. If stimulation is found necessary, alcoholic beverages should never be given by the mouth, because they likewise place the Thymol in solution. Such stimulation must therefore be administered hypodermically. The treatment thus outlined should be repeated for one day each week until the patient is cured.

Exception has been taken to the large dose of Thymol above recommended. The Porto Rican commission, whose experience was based upon 12,330 doses, expressed no fear of them, though they very properly caution against their administration in patients with chronic enterocolitis, œdema, great debility, senility, and chronic dysentery. Under such circumstances, it is the wiser plan to accomplish partial results with smaller doses, after which, when the patient's general condition has been improved, the full doses may be administered without danger.

Auxiliary treatment directed against the prostration and anæmia, as good feeding, proper remedies, fresh air, etc., are also in order and will hasten recovery.

Malden Hospital

# CHAPTER IV.

## INTOXICATIONS AND EFFECTS OF HEAT AND COLD.

### Alcoholism.

The treatment of alcoholism must necessarily vary according to the character of the alcoholic poisoning, *i. e.*, as to whether we are dealing with acute alcoholic intoxication, chronic alcoholism, or delirium tremens.

**Acute Alcoholic Intoxication.**—The ordinary case of acute alcoholic intoxication needs no other attention than such as may be necessary to protect him from injury or exposure to cold. The usual practice of letting the patient "sleep it off" covers the case. The patient will, however, regain his normal condition much more rapidly if he is given plenty of fresh air.

In very severe cases, where there is reason to believe that the patient has imbibed a dangerous quantity, or there is unabsorbed alcohol in the stomach, it is good practice to administer an emetic. The best for this purpose is Apomorphia; which should be given hypodermatically in one-tenth of a grain doses. In some cases the stomach does not have sufficient strength to eject its contents until the patient has been treated with cold effusions.

The condition of the heart and circulation demands special attention. Usually, aromatic spirits of ammonia in doses of one drachm or one or two hypodermatic injections of strychnia of one-sixtieth of a grain each will be all that is required. The stomach symptoms which persist after a debauch yield to one of two remedies, namely, *Arsenicum* and *Nux vomica*.

As soon as the patient's condition will permit of it he should be well fed. So long, however, as the tongue remains heavily coated or dry, solid food will do no good. It may prove advisable to clean out the bowels by the administration of a Calomel or Castor oil purge. Until the digestive system is in good condition the patient should be fed on nourishing broths, milk, eggs, and other light foods.

**Chronic Alcoholism.**—The treatment of chronic alcoholism is a complex problem. We have to deal with the morbid cravings of the patient, his neurotic condition, and the evil effects of the poison on his various organs, but especially upon his liver, kidneys, heart, stomach, and nervous system. This article will deal entirely with a consideration of the methods required to cure him of the habit. The treatment of the evil effects of alcohol on the various organs will be considered in other portions of this volume.

The question of environment is probably the most important one involved in the chronic alcoholic habitue. He may desire most sincerely to break himself from his habit, but if he is beset at every hand by alleged friends of convivial tendency he cannot be expected to reform. The great majority of cases are utterly helpless under ordinary conditions. All such should commit themselves to a well-conducted retreat or sanitorium, where they will be free from temptation and at the same time under capable medical supervision. Three months should be the minimum period allowed for this enforced seclusion, and the results will be more certain if the period is lengthened to six months.

Much depends upon the personality of the patient and his physician. Some men have sufficient strength of character to abandon the habit altogether after being bridged over a short period of craving. Some physicians have a personality which of itself is of the greatest value to their patients. We may call it personal magnetism or by other names, but it exists, and is an important element of success. I can recall one physician who has proven very successful with his patients. He has a charming personality, and has unlimited faith in his standard prescription for the reduction of the craving. As to his remedy, I have little or no faith in it; but his self-confidence and general bearing bolster up his patients and they do well. The majority of patients lack the will-power to resist temptation for any extended period following their removal from restraining influences, and it becomes our duty to do what we can to place them under proper conditions.

Thinking over the histories of cases I have treated, brings to mind patients who have remained free from their addiction over many years. Here is one man who was assisted forty years ago by a promise made to his brother, and who continued a teetotaller the balance of his life. There is another, a genius in his profession, who took up a residence in a temperance town while his central office was in a large metropolis. He visited his business office at long intervals, and for periods only sufficiently long to transact business. He kept himself busy with his work, but never permitted himself to become exhausted. Another, an inebriate, an eminent physician of his day, was enabled to break off entirely by taking an assistant, who relieved him materially during his busy season. And so I might recount others. No man, or at most very few men, are cured who take no measures looking to the removal of temptation or who do not provide themselves with mental occupation.

If in examining these patients we find faulty methods of living we should use judgment in correcting the existing evil. Thus, for example, we find a man needs exercise. To order for such a patient a course of uninteresting exercises in a gymnasium does no permanent good. He should be provided with an occupation that will take him out-of-doors, or a hobby

in which he will become greatly interested. One patient, who was for years a noted inebriate, and had had two or three attacks of delirium tremens, broke off his bad habits entirely by avoiding unfortunate associations and becoming an enthusiastic golfer.

Most of the cases come under treatment at a time when they are well-saturated with alcohol and in a serious condition. The first thing is to stop the alcohol. This may be done without any preparation whatever. It is not necessary to "taper off," though such a course is more pleasant for the patient. The fear that sudden withdrawal is productive of harm is groundless. Inasmuch as patient and friends are better managed if gradual withdrawal is practiced, most of us will find it wiser to have recourse to that method. Even then we meet with great difficulties. It is astonishing how such persons will find servants and others who will smuggle liquor into the sick-room, so that just at the time one is congratulating himself that his patient is doing well on an alcohol-free regime, he is doomed to disappointment at finding that, after all, the daily quantity of liquor consumed is as great as ever. It becomes our duty, therefore, in every case to secure positive loyalty on the part of attendants, and to keep our senses on the alert to detect any treachery.

During the early days of abstinence our most important objects are the improvement of the patient's digestion, so that he can be placed on a good nutritious diet as soon as possible, and the improvement of the nervous system.

The patient's appetite is bad, and not only are his digestive powers weak but absorption of nutriment and medicines is practically *nil.* The diet then must be liquid, and should consist of well-made beef soups or broths. These should be highly seasoned by the addition of five to ten drops of tincture of *Capsicum* with each feeding. Peptonized milk is also invaluable. In a very few days the patient is in condition to permit of the addition of solid food. If vomiting is persistent, *Arsenicum*, *Ipecac*, or *Nux vomica* will prove to be efficient remedies.

The nervousness and insomnia are the symptoms for which relief is most insistently demanded. Here we are in an uncertain position. It is the common custom to administer bromides and chloral. In all but few instances these are inefficient, any action from them being largely suggestive, unless the chloral is administered in dangerous quantities. They are, therefore, better let alone. If the excessive indulgence is of short duration, and it is probable that but one dose of a hypnotic is necessary, a single hypodermic injection of one-quarter of a grain of Morphia should be administered. For repeated use it is better by far to prescribe the newer hypnotics, especially Veronal, Chloralamid, and Paraldehyd. Of these, the latter, notwithstanding its disagreeable taste and odor, is the best adapted to alcoholic patients. The others are more uncertain than usual because

of the deficient absorptive function of the stomach and bowels. With the taking of additional quantities of food the nervous symptoms disappear.

Then we enter upon the most important part of our work, *i. e.*, the breaking up of the habit. As I have said before, recourse to a sanitorium is usually necessary.

As to assistance from the administration of medicines, we should be very conservative in our expectations. Undoubtedly, Strychnia is invaluable in many instances. It cannot be expected to act as more than a tonic. It certainly does not satisfy the craving. One of my patients, a periodical alcoholic, whose lapses are usually the result of overwork, finds great help from the following tablet:

| | |
|---|---|
| Strychnia sulph., | gr. $\frac{1}{20}$ |
| Zinc sulphide, | gr. $\frac{1}{10}$ |
| Hyoscyamine, | gr. $\frac{1}{400}$ |

This should be given three times daily after meals. I have used this combination a sufficient number of times to satisfy me that it is possessed of real value, but it cannot be regarded as a panacea. It certainly helps those who are resolved to do good—to resist temptation.

Hypnotism has been recommended as a curative measure, and remarkable cures reported. I have had no experience with it, and know of none among my acquaintances. There can be no objections to a trial.

Of the various specific cures which have been so lavishly advertised in lay journals, the most that can be said is that they act by suggestion. While the patients come out of their "present drunk" all right, as they do with almost any treatment, the vast majority soon lapse from virtue. A sufficient number remain well to advertise the "system" and keep it before the public eye.

**Delirium Tremens.**—Although the plans of treatment of delirium as outlined in medical text-books agree in all important particulars, nevertheless in practice one observes that practitioners exhibit the widest possible differences in their methods of application. The great variety in their methods has given rise to the view, and justly so, that delirium tremens is a self-limited disease.

Any one who has had an opportunity of making an autopsy on cases of acute alcoholism cannot help having been impressed with the very strong odor of alcohol in sections of the brain. The natural deduction from this observation is that elimination of the poison constitutes an important element in the treatment. Admitting then the presence of the poison in large quantities and the self-limited duration of the disease, one must conclude that the best treatment is that which will do no harm and will tide the patient over the short time necessary when nature will assert herself and a cure shall have been effected.

The first question that will obtrude itself on the practitioner is the administration of alcoholic beverages. There is a prevailing superstition to the effect that delirium tremens is due to the sudden withdrawal of the poison. In favor of this theory are the numerous cases originating in hospitals in patients who have been brought in suffering from fractures and various acute diseases and who are deprived by hospital rules of their regular beverage immediately after admission. On the other hand, we know full well that one of the earliest symptoms of patients about to take delirium tremens is a disgust for liquor. Every alcoholic who sustains a fracture or goes down with acute disease does not develop delirium tremens, though he be deprived entirely of his regular supply. It has been my experience to note in hospital practice that the patients who do develop it, never—or rarely so—exhibit a strong craving. In fact, our first intimation of his bibulous habits not infrequently is the advent of the characteristic delusions and delirium. It is difficult, therefore, to accept the doctrine that delirium tremens is dependent upon liquor restriction. It is much more reasonable to accept the view which now holds sway, that it originates in alcoholic saturation and poisoning. The natural deduction from this is that cases should be treated by rapid and complete withdrawal of the liquor, excepting in some cases of pneumonia, where it will be needed as a stimulant.

A very important point in the treatment of delirium tremens is careful, intelligent nursing. All undue excitement of any kind should be avoided. No one excepting the nurses and the physicians should be admitted to the sick-room. The room should be quiet and the light in it greatly subdued. In some instances, the latter precaution serves only to intensify the patient's hallucinations, in which case, of course, it should not be adopted. The question of physical restraint is a very important one, and its practice demands very nice judgment. In the great majority of cases, it is safe to say that all restraint should be avoided, because it is both unnecessary and harmful. It is unnecessary because with the exercise of tact nurses and physicians can generally control the patient to a wonderful degree. Many times have I seen a few judicious words cause the patient to quiet down. When restraint is required, it should be of as mild a nature as is possible to accomplish the result. It should be remembered that the patient is full of delusions of terrifying character. He imagines himself to be pursued by indescribable demons. Quite naturally, if we restrain the patient by violent means we do the very things which add strength to his delusions, and increase his struggles to escape. All cases are not amenable to tactful measures. Then we must use restraint. Probably the best means is that of holding the patient in bed by a sheet thrown over him, and fastened to the sides of the bed. When this fails, we must utilize the straight-jacket or the lock-straps. Under no circumstances should attendants be permitted to retain the patient in bed by throwing their weight on him. When a

padded room is available it is better to place the patient in it. Then he can roam about until he is tired, and without danger of damaging himself. The exhaustion which the movements thus permitted induces is often followed by a good sleep.

The great desire on the part of delirium patients to escape necessitates careful watching. Windows must be securely fastened. Indeed, it is exceedingly unwise to care for such a patient excepting on the first floor of a dwelling, unless the windows are protected by iron bars and efficient attendants are constantly on hand.

Hydriatric measures are sometimes useful. A hot wet-pack is often a most efficient sedative.

The diet should be nutritious. This is a very important point. It has long been noted that delirium tremens occur in alcoholics only after a period of long abstinence from food. This has suggested the advisability of good food in the treatment of the fully developed disease. Unfortunately, the patient can rarely take more than liquid food. This should include milk, eggs, beef-tea and well-made broths. The latter should be well seasoned with cayenne pepper, or ten to 20 drops of tincture of Capsicum added to each cupful.

The advent of sleep has always been regarded as a most favorable symptom. For this reason, it has been urged that hypnotics be administered freely in order to bring about this condition artificially. The employment of ordinary doses of potassium bromide and chloral, the drugs usually administered in these cases, fails utterly to produce sleep. One may make an even more positive statement, and say that doses of bromide and chloral capable of producing sleep in a severe case of delirium tremens are silly because useless; and large doses are dangerous. Therefore, both drugs should be expunged from the therapy of delirium tremens. If hypnotics are to be used, we should limit ourselves to *Hyoscine*, *Trional*, *Chloralamid*, and *Veronal*. *Hyoscine*, while most excellent at times, is very uncertain. When it does act the results are very satisfactory indeed. One cannot be satisfied that it has failed until he has tried various doses. Sometimes the two-hundredth of a grain every four hours is sufficient; in other cases, one-hundredth of a grain is required. One should not resort to the larger dose at once, because there are cases in which the Hyoscine seems to aggravate the delirium in the larger doses. The best effects are obtainable from hypodermic administration.

The combination of *Hyoscine* and *Morphia* is to be condemned. It is certainly efficient so far as quieting the patient is concerned; but it is badly borne by alcoholic patients, and I have seen serious results follow its exhibition.

*Paraldehyd* is the best of the synthetic hypnotics. It is objectionable because of its taste and odor, but it is efficient. The remaining hypnotics

act fairly well, but are slower than in ordinary cases, probably because of the poor absorptive functions of the digestive tract.

To obviate cardiac failure, heart stimulants are sometimes necessary. These include such drugs as Coffee, Caffeine, Cocaine, *Aromatic spirits of ammonia*, and Digitalis. The latter is regarded as especially valuable. Indeed, some authorities have advocated it as a specific in delirium tremens, using the drug in comparatively large doses.

*Strychnia* is a good general remedy in delirium tremens. It should be given in doses ranging from one-sixtieth to one-hundredth of a grain hypodermically every two to four hours.

As an eliminant, the *Liquor ammoniæ acetatis* as proposed by Norman Kerr is the best. Indeed, he relies upon this remedy as his sheet-anchor in the treatment of delirium tremens, and makes most remarkable claims as to results. As far as possible he avoids the administration of all sedatives. His dose is four to eight fluid drachms, which may be given every four hours. The results reported by Kerr are but little short of the marvelous.

When the temperature is high the cold douche or a cold wet-pack should be employed.

As to remedies, *Hyoscyamus* is, as a rule, better adapted to the type of delirium present than any other remedy. Occasionally, however, *Belladonna* or *Stramonium* will be more suitable. While in cases in which asthenia is profound, *Lachesis* or *Arsenicum* will prove useful. *Tartar emetic* is adapted to cases in which the gastric symptoms, especially the vomiting, are prominent. It is all the more indicated when pulmonary complications are present. *Arsenicum* is indicated by symptoms of gastro-intestinal irritation and albuminuria. Indeed, with renal symptoms prominent, no remedy is so likely to prove beneficial as *Arsenic*. *Cannabis Indica* and *Actea racemosa* are indicated by the character of the patient's hallucinations. With the former remedy, objects appear larger in size than normal, and seem at an unnatural distance; minutes appear like hours. Under Actea the patient sees rats, mice, and other unpleasant objects; he talks incessantly, not keeping himself on any one subject long enough to give any connected idea; he has occipital headache.

When suppression of urine threatens, hot fomentations should be applied to the loins and hot foot-baths given. Saline infusions and hypodermoclysis are also indicated under these circumstances.

### The Morphia Habit.

In the treatment of a patient with the morphia habit, the first thing is the isolation of the patient from family and friends. The place selected must be one in which every servant and attendant is absolutely trustworthy. The craving of the patient for the enslaving drug are so great that he will break every rule of common sense and adopt any device that will enable

him to secure the much coveted morphia. This statement may seem to the inexperienced as rather radical, but I can testify, from a dearly-bought experience, that one cannot be too careful in keeping an eye on all possible sources by which morphia can be smuggled into the sick-room. If patients are liberally supplied with money they will bribe servants and attendants. I have even known a wife to secrete morphia in a patient's laundry.

The patient who is under treatment for the morphia habit must undergo great suffering, the evidences of which are only too plain to those about him. They are usually so severe as to disorganize the nerves of the family, who by their intercessions and pleadings greatly interfere with the well-directed efforts of the physician. Even in the cases which are pursuing a most satisfactory course complications must arise, and a physician must have nerves of iron to act with good judgment in the midst of the surroundings in which he has placed himself by submitting himself to the possibilities of witnessing the grief of relatives. Seclusion is necessary then until the craving for the drug is fully overcome. Even then one cannot relax his watchfulness, for he knows not when, in a moment of weakness on the part of patient or others, the good work of months may be entirely destroyed.

I am fully aware that cures can be secured despite the absence of isolation of the patient, for I have been successful in the midst of such adverse circumstances; but my anxiety and responsibilities in managing the cases have been so great that I would not advise any one to place himself in such a position unless he is compelled to do so.

When, in accepting a case of the morphia habit, the physician finds his patient the victim of serious chronic disease, he should, for self-protection, acquaint the family of the dangers to be incurred. One knows not when the absence of the accustomed "dope" will cause the progress of a chronic disease to take on renewed activity and proceed to a fatal issue. This was my unfortunate experience in a case of diabetes seen in consultation with a confrère several years ago. One should also have a distinct understanding as to the time required for the treatment. If he errs in this direction it should be by overstating rather than by minimizing the time required. Three months should be the minimum, and an allowance of six months will be even better. To let the patient go after he is off his morphia a few weeks, which usually happens in the course of about six weeks, is to tempt a renewal of the slavery to drug addiction.

A proper place having been selected for the patient, he should be permitted to get accustomed to his surroundings before reduction in the daily quantity of drug is attempted. This time may be utilized by determining the amount of drug consumed, and instituting proper measures for improving the general health of the patient to enable him to withstand the ordeal through which he is about to pass. If he is in good physical condition,

which is rarely the case, nothing but the study of the patient need be attempted. Then the withdrawal of the morphia may be started at the end of a week or ten days. If, on the other hand, the patient is emaciated or dyscrasic, the regular measures for the treatment of nerve prostration, including absolute rest, massage, and good feeding, must be practiced. It is only when the patient has improved sufficiently to make it safe to start active treatment that the withdrawal of the morphia should be started.

The withdrawal of the morphia may be done by any one of three methods, each of which has its advocates. The first, which now has but few adherents, is the sudden withdrawal. At once, every grain of the drug is removed. Such a course results in great and unnecessary suffering on the part of the patient, and, at times, is not unattended by danger. To speak plainly, this method is brutal in the suffering it causes, and were the truth known has lost many lives. No matter what method of reduction be attempted, there is always an irresistible craving for the drug ; but the craving is doubly intense when the withdrawal is sudden. The patient commonly becomes irritable and unmanageable. He may even be driven to suicide. Such serious symptoms as rigors, vomiting, insomnia, diarrhœa, sweating, convulsions, and collapse may ensue. The only posssible excuse for instituting the sudden withdrawal of the opiate is in the few cases coming under treatment when the drug addiction has been of short duration.

The second plan of withdrawal is that of Erlenmeyer, and is known as "rapid reduction." The diminution in the daily dose is so arranged that at the end of a week to ten days the total quantity of "dope" is withdrawn. Some authorities have felt that this time is too short, and advocate an extension to two weeks. This method, like the first, is certain to be followed by unpleasant phenomena, but they are never as severe or as dangerous as under the treatment by sudden withdrawal. Much of the discomfort can be obviated by differentiating or individualizing the cases, and reducing the daily quantity of morphia according to the patient's condition. As a rule, the morphia habitue takes more than he needs. Hence, it is a comparatively easy matter to make a comparatively large reduction the first day.

The method of gradual withdrawal has the advantage of lessening the severity of the suffering, but it does so at the expense of prolonging it. Experience will teach that up to a certain stage it is a very easy matter to reduce the daily quantity of morphia. When that stage has been reached trouble begins, no matter what may have been the time taken to reach that stage. All things considered, the Erlenmeyer method will be found to be the best in the majority of cases. The first method is impracticable. The method by slow withdrawal will commend itself in but few instances in which rapid withdrawal is found to be impossible.

Of all the methods of treatment of the morphia habit that by the

bromides is unquestionably the best. This method was systematized by J. B. Mattison,* of Brooklyn. The originator proposes that, as in other methods of treatment, the patient receive some preliminary attention with a view of increasing his general health standard. Then he is given one of the bromides—Mattison prefers sodium bromide—in moderate dosage for two or three days, when the morphia is rapidly withdrawn, as in the Erlenmeyer system. In the meantime, the quantity of bromide is more or less rapidly increased, the daily quantity being governed entirely by its effects. The maximum dose being placed by the author at 100 grains twice daily. It is important that the bromide be administered in not less than two doses daily, in order to maintain the system under the constant and even influence of the sedative. It must, as in all other conditions in which it is given in large doses, be very freely diluted. With the maximum quantities above noted, not less than one glass, and better two glasses of water, should be given. The effect of this free dosage is not manifested for several days—five to seven—when the patient becomes drowsy, almost soporifous in fact. With this condition present the morphia is entirely discontinued with ease. In one severe case I gave much larger doses than those advocated by Mattison, namely, one-half ounce of a saturated solution of strontium bromide three times daily. It resulted in the production of a stupor, followed by a semi-idiotic mental condition, which did not fully clear up for nearly three weeks after the last dose of bromide. But when the patient regained his normal mental condition there was no further desire for the morphia.

Mattison believes that the bromide treatment is contra-indicated in cases presenting serious heart, lung, or renal diseases. We might add that all methods of treatment are dangerous under like conditions. Under no circumstances would he approach the treatment of a morphia habitue with such complications without serious misgivings.

Throughout the course of the treatment of the morphia habit the patient's strength must be maintained by a liberal and easily digested dietary. Milk and eggs constitute the staple articles. As soon as circumstances will permit, the patient must be gotten out-of-doors and gentle exercise permitted. As soon as the stomach and bowels appear to functionate properly the diet should be liberal. The majority of cases—if indeed not all—should be kept in bed until several days after the entire withdrawal of the Morphia.

The delirium and intense prostration which often mark the early days of treatment may be combated by judicious doses of Morphia. But the drug should be administered only when these symptoms become a serious matter.

The insomnia is best met by the administration of Trional in doses of 15 to 30 grains dissolved in hot milk, or 8 to 15 grains of Veronal given

* *The Mattison Method in Morphinism*, 1902.

in the same manner. These drugs should be given in one large dose about one hour before the time for retiring. It is a mistake to give divided doses at short intervals for they are then utterly useless.

Diarrhœa not infrequently occurs, for which *Cinchona* is the remedy.

Other methods of treatment have been advocated, but lack the sanction of authority and general experience. One of these consists of gradually substituting Codeia for Morphia and then weaning the patient from the Codeia.

*Hysocine* in doses of one one-hundredth of a grain to one two-hundredth of a grain every four hours has also been advocated, and has succeeded in a number of instances. This treatment has considerable to commend it, but the Codeia treatment is to be mentioned to be condemned.

For the treatment of the weak heart which frequently supervenes during the treatment by withdrawal, *Sparteine*, *Strychnia* and *Glonoin* afford the best results.

Throughout the course of the treatment it is absolutely essential to keep the patient in entire ignorance of the extent to which the drug has been reduced. Indeed, it is often wise to continue hypodermic injections of distilled water for two or three weeks after all craving has ceased. It is also important that the patient remain under restraint for an additional period of two months; otherwise, a relapse is certain to follow.

## Heroinmania.

The frequency of the administration of Heroin for relief of cough, and its probable incorporation into cough mixtures sold indiscriminately to the public, make the problem of Heroin addiction an important one, especially as the profession and laity alike have little or no apprehension as to the forming of the habit. The facts at present at our disposal demonstrate the following: 1. That Heroin is as surely capable as Morphia of producing a habit, the clinical manifestations of which are of a far more serious nature. 2. That the Heroin habit cannot be continued for anything like the time other drugs can be used. The period of tolerance is soon reached, after which the general health rapidly deteriorates until a fatal issue is reached. 3. Heroin lacks the ability of Morphia to produce temporary stimulation of the mental faculties. Its invariable effect is torpor. 4. Heroin exerts its chief influence on the medulla oblongata, and hence disturbs vital functions. 5. Convalescence from the Heroin habit is always slow, and even more unsatisfactory than in the case of Morphia. 6. The too rapid withdrawal of Heroin in those addicted to its use is liable to prove a more serious matter than in the case of the Morphia habit. In the latter we can always secure the necessary stimulation by the timely administration of a dose of Morphia. With Heroin, we cannot do this, but must use not only that drug but other stimulants, as Caffein, Ether, etc,

In mild cases, which means those who have taken the drug for but a short time, and have come to dread it because of its bad influence on the vital functions, but little difficulty is found in stopping the drug. In confirmed cases, the problem is best solved by substituting Morphia for the Heroin until such times as the Heroin is entirely eliminated from the daily curriculum. We then have the case reduced to the more simple one of Morphia habit.

It is said that Dionine presents the same dangers as to the formation of a habit as has Heroin. But as yet time has not elapsed to acquaint us with the full dangers.

## Chronic Lead Poisoning.

(*Plumbism.*)

In the treatment of chronic lead poisoning we have to consider prophylaxis as the most important part of the problem in hand; and in the case of the fully developed intoxication the management of lead colic, paralysis, interstitial nephritis, and encephalopathy.

**Prophylaxis.**—This demands a thorough understanding as to the means by which lead enters the system, and these may be divided into two classes, namely, the industrial and the accidental. Industrial poisoning is pretty well understood, and if proper regulations are enforced by proprietors or carried out by individuals engaged at working in lead should become a very rare condition. Accidental poisoning cannot be so easily guarded against, for the victim is not in a position to protect himself against unknown dangers.

**Industrial Poisoning.**—Experience has taught that predisposition is apparently a factor in lead poisoning; for men have been known to work for many years without incurring the slightest ill-effects, while others working beside them have succumbed within a month or two. That personal habits may have been productive of such differences in susceptibility is probably true, but they cannot account for it at all. We must admit that there exists an hereditary susceptibility in many instances; that children and women in particular are sensitive to the poison; and that previous attacks of plumbism increase individual susceptibility.

Far more important than the predisposing factor is the question of personal habits. Alcoholic indulgence, sedentary habits, a general unhygienic life, and above everything else a lack of personal cleanliness, are active etiological factors. The carelessness as to cleanliness relates in the majority of cases to neglect of the hands, the histories of cases of plumbism showing that the patients permit particles of lead to accumulate under the finger-nails, or in the folds of the skin, and while the hands are in this soiled condition do not hesitate to handle food and other substances which are to go into the mouth. This is the usual state of affairs in cases of poisoning occurring among painters.

In certain occupations the lead enters the system by the respiratory tract, as in white-lead works, the manufacture of electric storage batteries, smelting ores, etc.

The occupations which have been known to produce lead poisoning include shot-making, type founders, compositors, plumbers, lace making, pottery workers, and manufacturers of certain pigments.

From the above cursory review of the causes of industrial poisoning the prophylactic treatment is obvious. *Cleanliness of workmen and shops* is the most important factor. Unfortunately, this is not easy to enforce, because workmen will get careless, and employers will look to the expense. Workers in lead should make it an invariable rule not to chew or smoke while at work, or until they have been thoroughly cleaned. Immediately after ceasing work the hands should be thoroughly washed, and the accumulations of dirt beneath the finger-nails removed. Clothing should be changed. If the occupation involves exposure to dust containing lead, workmen should wear respirators. This they will rarely do.

On the part of employers, it is incumbent that the shops be well-ventilated (using exhaust fans if necessary), that they be sufficiently large to give each workmen a proper cubic feet of air space per head and that as few men as possible shall be exposed to the more dangerous processes of working the lead.

As preventive measures which are said to possess some value, and which certainly cannot be productive of any harm, is the taking of a meal (breakfast) rich in nitrogenous food before beginning. The taking of fats, as butter and olive oil, has also been highly recommended. Milk has also gained a reputation as a preventive. It may be that these foods possess the virtues ascribed to them ; but it is also possible that the benefit arises from the fact that the patient begins the day with a full stomach, consequently experience no hunger until the noon recess arrives ; or that such food favors good nutritive conditions.

**Accidental Poisoning.**—Accidental plumbism arises in the majority of cases from contamination of the water supply of a household or a community, usually by means of lead pipes, more rarely from lead tanks. Cases have also been reported as resulting from adulteration of food, diachylon ointment, sleeping in freshly-painted rooms (?), cosmetics, hair dyes, etc.

**Treatment of Lead Poisoning.**—The patient should be removed from the environment of the poison, after which active steps for the elimination of that within his system should be instituted. A free preliminary purging will rid the gastro-intestional tract of any remaining there. Following this he should be given *Potassium iodide* in doses of from three to five grains three times daily. Its beneficial action is believed to be due to the formation of a soluble double iodide of lead and potassium. Larger

doses than those recommended are not advisable, as they would place in solution in the tissues an unsafe quantity of lead.

Special symptoms which require attention include constipation, colic, paralysis, nephritis, and encephalopathy.

**Constipation.**—The best drugs for promoting the action of the bowels are the saline purges, which may be given internally, or as enemata containing from one-half to one ounce of Magnesium sulph. In many instances these fail to act until the spasm of the intestinal walls has been overcome by the administration of Morphia or Atropia. In a fair proportion of cases, Morphia alone is sufficient to produce an evacuation of the bowels. It is important that the bowels be kept more than normally active to aid elimination. It is generally regarded that two or three stools daily are necessary.

**Colic.**—Ordinarily, the pains are fully relieved by hot applications to the abdomen. If these fail, we may prescribe Atropia, which owes its palliative action to its ability to overcome spasm of involuntary muscular fibres. As a last resort we have Morphia hypodermically, which is always efficient, but is unsafe for repeated administration because of the danger of forming the drug habit.

**Paralysis.**—Lead palsy is to be treated on the same principles as those required for the management of local paralyses in general. Massage and electricity are the most important remedies.

**Nephritis and Encephalopathy** must be treated on symptomatic lines together with the measures required for elimination of lead.

A free use of pure water is advisable as a routine measure in all cases. General massage is a most excellent measure for promoting elimination, but the attendant expense makes it impracticable for the class of patients who have plumbism.

**Remedies.**—The medicines to be prescribed in cases of lead poisoning include *Alumina*, *Platinum*, *Nux vomica*, and *Opium*.

### Chronic Mercurial Poisoning.

Chronic mercurial poisoning may be industrial or accidental. The industrial poisonings arise principally in the Mercury mines of Spain and California. In most communities the chief danger is found by those who work in felt hat factories. Other occupations favoring mercurial poisoning include gilding of mirrors, and the manufacture of barometers, thermometers, etc.

The danger incurred by those who work in Mercury is due to the fact that this metal is volatilized at ordinary temperatures, as low indeed as 8° F. In the case of workers on felt hats the poison enters the respiratory tract in the dust from the felt.

Accidental poisoning has arisen from the use of mercurial preparations

in medicine, though not with such great frequency as in former years. The special preparations which have done harm include the ill-advised use of Calomel internally and mercuric chloride douches. At the present time, physicians no longer prescribe the large doses of Calomel so much in favor in years gone by. Patients not infrequently poison themselves by self-drugging or by renewing prescriptions without medical authority. The danger of bichloride douches is by no means an idle fancy. A number of cases have been reported in literature, and one of my patients succeeded in contracting a severe mercurial stomatitis after a short season of bichloride douches, 1:2,500.

**Prophylaxis** demands that workshops shall be well-ventilated; that workingmen shall pay strict attention to cleanliness as laid down in the chapter on lead poisoning; that factory rooms shall be constructed so as to have but few crevices in which particles of Mercury can lodge.

**Treatment.**—The patient must give up his occupation with the appearance of the first symptoms. *Potassium iodide* is the best eliminant of the poison. The mercurial stomatitis should be treated by *Potassium chlorate* locally, as recommended in the section on *Ulcerative stomatitis*. The tremor and other nervous symptoms are very difficult of control; indeed, they are ofttimes incurable.

The antidotes to chronic mercurial poisoning include *Nitric acid*, *Hepar*, *Potassium iodide*, and *Aurum muriaticum*.

## Chronic Arsenical Poisoning.

(***Arsenicism.***)

Chronic arsenical poisoning arises in persons possessed of an idiosyncrasy to the drug when exposed to the emanations of arsenical wall-papers, paper flowers, and certain dress goods. Mild cases have also occurred in persons who have taken Fowler's solution without medical supervision. Some few cases have also arisen from the wearing of furs which have been cured by arsenic, these containing as much as from 1 to 17 grains per square yard. Considerable excitement and alarm concerning arsenical poisoning was excited in Massachusetts about 12 years ago, as a result of which laws were passed making the maximum amount of Arsenic permissible 0.1 grain per square yard in wall-papers, and 0.01 grain per square yard in dress goods.

The occupations capable of producing arenicism are mainly the mining and smelting of arsenical ores. The dangers from this source have been greatly minimized by hygienic supervision.

**Treatment.**—The majority of cases make prompt recoveries as soon as the cause is discovered and removed. The gastro-intestinal symptoms in particular demand no special treatment.

Our main trouble arises in the management of the cases in which neu-

rasthenia or neuritis are the prominent features. These require considerable time, even months, for their cure. Their management is strictly symptomatic. *Potassium iodide*, in doses of three to five grains three times daily, is the best eliminant.

The general hygienic and prophylactic measures of use are practically identical with those already recommended in the article on plumbism.

Remedies that have been recommended for chronic arsenical poisoning include *Camphor*, *Cinchona*, *Ferrum*, *Ipecacuanha*, and *Veratrum*.

## Food Poisoning.

(***Ptomaine poisoning.***)

The treatment of food poisoning can be outlined only, as it is impossible to lay down specific measures owing to the variety of poisons which may develop in spoiled food and the necessarily different phenomena following their ingestion. Some of the poisons are inherent in the food itself, as is the case with the various species of the Terodon and Diodon of Japan and India. In still other instances the poison is developed by bacteria; sometimes the poisoning is due to the bacteria themselves; and again, the contamination may take place through the accidental entrance of metallic poisons. It is self-evident then that the symptoms of food poisoning must present the greatest possible differences. In some cases the symptoms indicate a cerebro-spinal poison; in others a marked gastro-intestinal irritant. Sometimes the poisoning phenomena do not appear until a number of hours after the ingestion of the suspected food; in others, the patient is taken almost immediately with violent vomiting and purging.

In our management of food poisoning, therefore, we are obliged to rely upon general principles. The first thing to do is to empty the stomach of any food remaining, which may be done most efficiently by the stomach tube. Apomorphia hypodermically, Zinc sulphate, Ipecacuanha, warm mustard water, may also be used as emetics. If vomiting is already present, and is sufficiently severe to be efficient, it should be encouraged rather than suppressed. The intestinal tract should likewise be emptied by a purge, of which Castor oil is the best. Again, if purging is already present and is energetic, the Castor oil may be dispensed with and the diarrhœa permitted to run itself out.

When the stomach and bowels have been effectually cleared, and there persists empty retching and inefficient urging to stool, it is time to act for the relief of the gastro-intestinal condition. At this stage the most efficient remedy is Morphia sulphate hypodermically in one single dose of a quarter of a grain.

*Arsenicum*, *Veratrum album*, *Camphor*, and *Nux vomica* may be considered as remedies.

Cases presenting symptoms showing that the circulation and the cere-

bro-spinal system are bearing the brunt of the attack require the preliminary measures for eliminating the poison, and, subsequently, remedies prescribed symptomatically to combat the prostration, etc.

## Ergot Poisoning.

(*Ergotism.*)

The important item in the treatment of ergot poisoning is the discovery and removal of the cause. The majority of cases recover as soon as the patient is removed from the unfavorable influence. A variety of measures may be demanded for the symptomatic treatment, as the clinical phenomena may be nervous (paralytic), convulsive, or gangrenous.

The principal antidotes to Ergot are *Camphor, Solanum nigrum, Belladonna, Hyoscyamus, Arsenicum*, and *Stramonium.*

While recovery from the ataxia and paralysis usually follows, it is necessarily slow.

The gangrene must be treated on general surgical principles, and, at the same time, measures to combat the exhaustion must be carried out.

## Lathyrism.

Poisoning by Lathyrus or the Vetch is very rare, even in Austria, Italy, North Africa, and India, the only places in which it occurs. The majority of cases make excellent recoveries when removed from the deleterious influence of the poison. The treatment is purely symptomatic.

## Snake Venoms.

The first steps to be taken in case of bites by venomous serpents can be carried out by any person of average intelligence. They include measures designed to prevent absorption of the poison and to remove it from the point of inoculation. To prevent absorption, the only recourse is the tying of a tight ligature around the injured extremity above the wound. A handkerchief, a piece of stout string or twine, or any material that may be available can be used. The ligature should be applied sufficiently tight to cause the extremity to assume a livid hue.

To remove the poison from the wound, it should be freely incised or opened to promote bleeding, and the part should be sucked or a cupping glass may be applied. Sucking the wound is the handiest and is without danger to the party trying it if he has no abrasions about the lips or mouth.

The poison may be neutralized at the site of the wound by the injection of certain chemicals, of which 1 per cent. solution of Potassium permanganate enjoys the greatest reputation. Other chemicals that have been recommended include Calcium chloride (1:60), Gold chloride (1:1,000), and Chromic acid (1 per cent.).

General stimulation is indicated in all cases, but must be carried out with some judgment. The popular belief that alcohol is an efficient antidote to snake venom is only partially true. Given in moderately large doses, but not to intoxication, it is helpful, but when pushed, as commonly advised, to an extreme, it is capable of doing harm rather than good.

The injection into a vein of 10 to 20 minims of ammonia in an equal part of water is a good stimulant, but it has no specific antidotal properties.

Hypodermic injections of Strychnia have been recommended, but statistics and experimental investigations seem to prove that the drug does harm; at least the cases so treated show a smaller percentage of recoveries than do those which did not receive Strychnia.

Artificial respiration maintained for a prolonged period, *i.e.*, an hour or more, is of distinct value.

The specific treatment of snake poisoning has received considerable attention of late years. The facts at present at our disposal seem to prove pretty conclusively that Calmette's Antivenene is of unquestionable efficiency. This serum is now prepared so that it will keep certainly for two years, and it is believed that under proper precautions it retains its antidotal properties for an indefinite period. It is still a debatable question whether the Antivenene prepared from one variety of venomous serpent is suitable for the treatment of poisoning by all varieties. The trend of expert opinion favors the view that each venom requires its own specific serum of Antivenene. Attempts are now being made to prepare a polyvalent serum. Experience relating to this subject is too recent to enable one to speak authoritatively on the subject.

Convalescence from the bites of venomous serpents is slow. After the first effects of the poison have been antagonized, the case must be treated symptomatically by medicines and general hygienic directions.

### Thermic Fever and Heat-Prostration.

Before commencing the treatment of a patient who has been overcome by heat, it is essential that a correct diagnosis of the condition present be made, for the treatment which is appropriate to thermic fever is detrimental to heat prostration and *vice versa*. Success is to be obtained in either case by early and vigorous practice of the proper therapeutic measures. In thermic fever or sunstroke, in particular, the treatment should be begun as soon as the patient is discovered without waiting to transport him to his home or to the hospital. As to the treatment required, authorities are all agreed that the important remedy is abstraction of heat by free applications of ice or cold water. The rule is for cases of sunstroke to present temperatures of from 105° to 110° F. The antipyretic applications are to be continued until the temperature drops to 101° F., when it may be safely dis-

continued. Nevertheless, the patient should be carefully watched, and the cold bathing renewed whenever the temperature rises to 103° F.

The hydrotherapy of thermic fever is practiced in a very simple manner. The one essential is that cold water and enough of it is brought into contact with the patient's body. The simplest method is that in vogue in hospitals. The patient is disrobed, and placed on a cot covered with a rubber sheet and protected by a tent. Water is turned on him from a hose, and continued until the desired result is attained, which is usually within half an hour. In the home or on the street the water may be iced and poured over the patient from buckets.

Another and very easily applied means of heat abstraction is the ice rub, which consists in rubbing the patient's naked body with ice until the temperature has fallen to the proper level.

In the case of children, the above methods may be attended by considerable struggling or resistance. Under such circumstances the little sufferer should be wrapped in sheets wrung out in iced water, and these should be renewed as rapidly as they become warm, or the coldness of the sheet may be maintained continuously by rubbing it with ice.

The injection of iced water into the rectum and the application of the ice-bag to the head aid the general applications.

The ice-pack to the side of the body, while fairly efficient as a means of reducing the patient's temperature, is not as successful a means of treatment as the free use of cold water, as it lacks the stimulating qualities of the latter arising from the forcible impact of the water against the patient's body.

The great majority of cases require no other treatment than the above. It is only when special symptoms arise that other measures must be brought to our aid. The most important, as well as the most frequently observed of these are convulsions, twitchings, and delirium. Ether or chloroform pushed to the extent of anæsthesia, which must be maintained for several hours, is generally used, and with good results. Morphia given in doses of one-sixth of a grain hypodermically is also an efficient anti-spasmodic, and accomplishes the purpose with much less trouble.

Bleeding is now seldom used, even by old-school authorities. Its main claim for notice at the present time seems to be that it is reputed to have saved the life of an eminent physician years ago. H. C. Wood condemns its practice as positively harmful.

The various antipyretic drugs have been tried, and while they do succeed in reducing the temperature in a measure, the results following their administration are by no means as good as the hydriatric treatment.

**Heat Prostration** calls for an entirely different line of treatment from that outlined above. This can be easily surmised by any physician who has observed the weak pulse and the cold clammy surface of the body

in these cases. Instead of active antipyretic treatment, the patient requires active stimulation and restorative measures. To this end, the measures indicated for cases of syncope in general are indicated. The patient must be placed in a recumbent posture and protected from the sun. If ammonia is handy, he may be given a few whiffs of its fumes. As stimulants, aromatic spirits of ammonia, in doses of one drachm in one ounce of water, or whisky should be administered. If the patient is unable to swallow, whisky, brandy, or strychnia should be given hypodermically. The proper hydriatric treatment is the hot wet-pack. Extreme cases demand the administration of hot saline infusions hypodermically or by the rectum.

The convalescence of cases of heat-stroke should be conducted on general principles, symptomatic treatment being our mainstay.

### Subnormal Temperature.

In the majority of cases presenting subnormal temperature therapeutic measures must be directed to the primary cause alone, as in cases of malnutrition, heart disease, hæmorrhages, tuberculosis, and certain nervous conditions. When, as is commonly the case, the patient is confined to his bed, we find in the application of hot bottles to the extremities and sides of the body an invaluable adjuvant. Respecting this use of hot bottles or dry heat there is a very important precaution to be observed. The bottles, whether of the ordinary kind or made of rubber, should be thoroughly wrapped in flannel or woolen goods, first, because a greater degree of heat may be maintained without burning the patient; and, secondly, because the bottles need not be changed so frequently.

When stimulants are required, those of a quickly acting character, as the various alcoholic preparations, *Camphorated oil* and *Aromatic spirits of ammonia*, should be administered. Cases *demanding* such stimulation are usually of a serious character, the vital powers being at a low ebb. Care should be taken therefore that the stimulation is not overdone, lest it destroy the little energy still preserved by the patient. If one succeeds in keeping the patient from getting weaker while curative measures do their work he is doing all that he can possibly expect.

Of the various causes of low temperature, all will be considered under appropriate headings in other portions of this work, with the exception of the effects of exposure to cold. Hence, the latter condition will receive attention at this time.

The remedies for collapsic temperature include *Camphor*, *Carbo veg.*, *Arsenicum*, and *Chininum arsenicosum*.

## Effects of Exposure to Cold.

Patients who are apparently dead from prolonged exposure to cold should not be given up too readily, because cases of recovery have followed even after several days of continued exposure under the snow. The treatment in such cases includes artificial respiration with brisk friction of the body. Under no circumstances is it permissible to place the patient in a warm room or near a fire.

The local injuries from exposure to cold include chilblains, frost-bites, and actual freezing of parts. In all the early treatment is the same. Success depends upon the slowness with which circulation is established. To begin with, the affected parts should be well rubbed with snow or ice; then ice water should be applied and this, too, with brisk friction. Finally, the parts should be dressed with an ointment of 25 per cent. Ichthyol. The final lesions, whether blebs, ulcerations or sloughing, should be treated on the ordinary surgical principles governing the management of such lesions arising from other causes.

Painting the affected parts with 1 per cent. *Silver nitrate* solution followed by enveloping them in raw cotton relieves the distressing itching.

## Rigors.

Patients in rigor usually present high temperature. Nevertheless, they are usually made more comfortable by application of hot-water bottles to the extremities and protection by blankets. Rigor or chill usually being symptomatic of some affection requires little special treatment. The remedies which are most frequently indicated include *Aconite*, *Chininum, sulph.*, *Arsenicum*, *Dulcamara*, and *Echinacea.*

Nervous chills (so-called) usually find their remedy in *Ignatia.*

In the main, the presence of chills or rigors can be neglected so far as treatment is concerned. The principal attention must be paid to the primary condition.

# CHAPTER V.

## DISEASES OF THE MOUTH AND TONGUE.

As explained in my work on Diagnosis, the clinical features of the various diseases of the mouth have much in common. Their differentiation is based mainly on one or two special features which give character to each variety of stomatitis. So, too, in etiology we find many common factors, the most noteworthy of which being traumatism and lack of cleanliness. Many times these are aided in their disease-producing effects by special constitutional weaknesses, which must be taken account of in the treatment. The majority of cases occur in infants and young children. The prophylaxis of stomatitis includes, therefore, the various measures necessary in the care of the mouth at that time of life.

**Hygiene of the Infant's Mouth.**—As part of the toilet of the newborn infant, the mouth should be most carefully washed with boiled water. For this purpose the nurse must use a piece of soft linen, and her manipulations must be of the gentlest possible character. Carelessness in the latter respect may be the cause of active inflammation or ulceration. After this cleansing, it is only necessary to cleanse the mouth once daily in the case of an infant fed by the breast. Before and after nursing it is always a good precaution for the mother to clean her nipple thoroughly with boiled water. This simple precaution will almost certainly prevent mouth infection of the nursing infant.

In the case of bottle-fed infants, the most important prophylactic measure against stomatitis, and, indeed, against many other infantile ills, is attention to the rubber nipples. These should be cleansed thoroughly after each feeding, and occasionally boiled in a solution of bicarbonate of soda. While not in use they should be kept in sterilized water. It is presupposed, of course, that the proper precautions looking to the purity of the child's food supply (as outlined in the chapter on infant feeding) have been attended to. Cleanliness of the child's mouth is always an important matter, but this must be secured by gentle manipulations. Roughness in cleansing causes abrasion of the buccal epithelium, and this traumatism is an important means of infection.

Antiseptic mouth-washes are entirely unnecessary in the care of a healthy mouth, although in the case of adults there is no objection to the employment of the various elegant pharmaceutical preparations sold for this purpose. Pure water is as efficient a cleansing agent as any. Herein ex-

ists one of the inconsistencies of humanity. People who observe the greatest precautions as to the character of the water they drink are oft-times careless as to the purity of that with which they use in cleaning the mouth; and yet it is possible to convey infection in one way as in the other.

**Local Remedies in Stomatitis.**—The principal remedies used locally in the treatment of the different varieties of stomatitis include Borax, Boracic acid, Hydrogen peroxide, Potassium chlorate and Sodium sulphite. In the case of young infants and children it is necessary to apply them by a soft linen rag over the nurse's finger. Especial attention should be paid to the cleanliness of the nurse's finger-nails and hands, particularly if she is in charge of other children.

**Simple or Catarrhal Stomatitis** does well, as a rule, on simple cleansing measures only. If any medicated mouth-wash is used, it should be of a simple character. Among those to be recommended are Potassium permanganate, 1: 2,000 to 1: 5,000; Borax, 3 per cent.; Thymol, 1 : 3,000. Half a drachm of tincture of myrrh in a glass full of water is very agreeable as a mouth-wash.

The most important internal remedies are *Mercurius*, *Kali chloricum*, *Phytolacca*, and *Borax*.

In the case of catarrhal and other varieties of stomatitis occurring in adults, it is always an important matter to have the condition of the teeth attended to by a competent dentist.

**Mycotic Stomatitis; Thrush.**—Thorough cleansing of the mouth is of especial importance in thrush, as the disease cannot appear if proper hygienic conditions of the mouth prevail. The fungus should be gently wiped off with a moist linen rag, after which the parts should be washed with a 5 per cent. solution of Borax. In the case of infants, the Borax may be mixed with some glycerin. While honey is a good vehicle for Borax, and is generally recommended for use in infantile mouth inflammations, its use in thrush is not above criticism, for it is capable of increasing the activity of the fungus growth. For the same reason, foods which contain sugar must be avoided. In very severe cases occurring in cachectic children, the irritation of the nipple prevents healing. In such cases, it is a wise plan to feed the patient by the stomach tube for two or three days. As the constitutional condition has much to do with the taking and perpetuation of the disease, care in diet and fresh air are important therapeutic adjuvants. If the child is breast-fed, attention should be paid to the mother's health. Of special importance for her is a life in the open air as far as possible.

Alkaline mouth-washes, *e. g.*, bicarbonate of soda, have been recommended on theoretical grounds, as the fungus does not thrive in an alkaline medium. Practice has not borne out this theory. The most that such washes do is to soften the epithelial accumulation and assist its removal.

The remedies most frequently indicated in thrush are *Borax*, *Phytolacca*, *Rhus*, *Nux vomica*, *Hydrastis*, *Mercurius*, and *Sulphur*.

**Aphthous Stomatitis.**—This requires the same general measures as are important in simple stomatitis. The best local application is Borax, which in the case of children may be mixed with honey, glycerin or water, 95 per cent. of menstruum and 5 per cent. of Borax. If this treatment fails, the small ulcers may be touched with finely powdered burnt alum on a camel's hair brush. In extreme cases a nitrate of silver point may be used.

There is a chronic form of aphthous stomatitis which is not uncommon in adults, and is very resistant to treatment. Most of its victims are highly neurotic subjects. The local measures above recommended may be used during the attacks or while the ulcerations are present; while general hygiene and internal medication are employed to raise the health standard. *Hydrastis Canadensis* and *Argentum nitricum* are the most efficient remedies for the chronic or relapsing form.

Thomas,* of the Eclectic School, considers *Phytolacca* a specific in aphthous stomatitis. "Where the tissues are bluish and the breath bad, *Echinacea* will prove more effective. Where the tongue is covered with a moist, yellow, pasty coating, *Potassium chlorate* and *Hydrastis*, one drachm to water four ounces, a teaspoonful every hour, will give relief and the best results."

**Ulcerative Stomatitis.**—Severe as are the clinical manifestations of this variety of stomatitis, it yields very promptly to its specific, Potassium chlorate. This drug is excreted in the saliva. The result of its administration, therefore, is to keep the mouth continuously bathed in a weak solution of that salt. At the same time a mouth-wash of Potassium chlorate, three grains to the ounce, may be prescribed. Internally, two grains of the crude drug, well diluted, should be given every hour for the first day; after which the intervals between doses should be lengthened to two or even three hours. In addition to Potassium chlorate, we may prescribe *Mercurius solubilis*, *Argentum nitricum*, *Baptisia*, or *Nitric acid*.

Owing to the disintegration of tissues and the fœtor, thorough cleansing of the mouth is of great importance. This is best accomplished by a wash of equal parts of Peroxide of hydrogen and water.

Care should be observed in the administration of Potassium chlorate, as in overdosing it has a deleterious influence on the kidneys.

**Mercurial Stomatitis.**—The lesions of this form of stomatitis being practically those of the ulcerative variety, its treatment is pretty much as above outlined. Persons who are exposed to Mercury in the manufactures and arts should guard themselves against a stomatitis by regular cleansing of the mouth and care of their teeth. The special medicinal antidotes are

* *Practice of Medicine*, p. 491.

small doses of *Potassium iodide*, *Hepar*, and *Nitric acid*. *Atropia* is recommended by old-school authorities to control the salivation.

**Bednar's aphthæ** being practically a traumatic affection requires no treatment other than cleanliness gently carried out. In some very severe cases—a condition that can come from neglect only—it may be necessary to touch the ulcerations with the nitrate of silver point.

**Membranous stomatitis** scarcely ever occurs excepting in conjunction with faucial diphtheria. Its treatment is that of the primary affection, the free administration of the diphtheria antitoxin, together with the thorough cleansing of the mouth indicated by the local condition.

**Noma; Gangrenous Stomatitis.**—Gangrenous stomatitis occurs almost exclusively in cachectic children, and in the majority of cases runs a rapidly fatal course. The treatment involves attention to the constitutional state by the free administration of highly nutritious liquid foods and radical surgical procedures. As soon as the condition is recognized, the lesion should be freely excised, care being taken that the knife is carried well beyond the borders of the ulceration, for the gangrenous process beneath is usually more extended than that on the surface. The edges of the wound should then be freely cauterized by the Paquelin cautery or pure carbolic acid. Peroxide of hydrogen is the best mouth-wash for these cases. One great danger of gangrenous stomatitis is the aspiration of the fœtid discharges, which entering the respiratory tract must necessarily set up a pneumonia followed by pulmonary gangrene. Likewise, the swallowing of the buccal secretions is likely to produce severe gastro-intestinal irritation. These secondary accidents are important elements in the fatality of the disease.

The internal remedies for gangrenous stomatitis are *Arsenicum album*, *Arsenicum iod.*, *Chininum ars.*, *Carbo veg.*, *Phytolacca*, *Lachesis*, and *Mercurius cor.*

**Perleche.**—Owing to the contagious character of this disease cleanliness is especially important. The best local application is sulphate of copper. Borax and boric acid are absolutely useless.

**Riga's Disease** is best treated as catarrhal stomatitis or simple ulceration. The origin of the disease being probably traumatic no constitutional taint stands in the way of recovery.

**Syphilis of the Mouth** requires no local measures other than such as are required to reduce any mechanical irritation, as from decayed teeth, and for the maintenance of cleanliness. The constitutional treatment is that of syphilis, to the article on the treatment of which the reader is referred.

**Tuberculosis of the Mouth.**—The constitutional measures for the relief or cure of buccal tuberculosis are the same as those already recommended for the treatment of tuberculosis of the lungs. In the early stage

tuberculous ulcers of the mouth yield very readily to treatment. The most efficient remedies are a 50 per cent. solution of lactic acid or iodoform paste well rubbed into the ulcers three or four times. When the ulcerations have proven too extensive for this simple treatment, it is necessary to curette them with a sharp spoon, followed by the application of the Paquelin cautery. Iodoform paste is the best post-operative application.

Very advanced cases refuse to yield to any treatment. In such cases all we can do is to make the patient as comfortable as possible, and apply such treatment as will retard the advance of the disease, and alleviate suffering. Iodoform still continues to be the best local medicament. Menthol in oil in the proportion of 10 per cent. sometimes quiets the pain. In many instances nothing relieves but morphia, which should be given as needed, as the acquiring of the morphia habit in patients of this class is not an evil. To give the patient comfort while eating, the ulcerations should be painted with a 5 per cent. cocaine solution.

**Foot and Mouth Disease.**—Although the clinical phenomena of foot and mouth disease are ofttimes severe, most cases do very well on purely symptomatic treatment. It is necessary to send the patient to bed until the fever and the subsequent exhaustion have subsided. The diet must be liquid until the ulcerations have healed. Locally, frequent rinsing of the mouth is essential for purposes of cleanliness. Chlorate of potash has been highly recommended, but it is doubtful if it is any more efficient than the simpler drugs, peroxide of hydrogen and boric acid and borax. The ulcerations on the extremity usually require no treatment other than the application of a simple dusting powder. Internally, *Belladonna*, *Mercurius*, *Rhus tox.*, and *Croton tiglium* are the remedies mostly indicated.

When foot and mouth disease breaks out in a school or a community the important prophylactic measure is the boiling of all milk, for it is by this fluid that the disease is transmitted.

**Remedies Indicated in the Different Varieties of Stomatitis.**—*Borax* is one of the most commonly used remedies in mouth inflammations. It is especially applicable to aphthous and mycotic stomatitis, though of value in all varieties. A "keynote" for this remedy formulated by Dr. H. N. Guernsey is "Child dreads downward motion." The patient, if an adult, complains of itching of the mucous membrane and dryness of the mouth. In cases of aphthæ, the mucous membrane of the mouth bleeds from slight manipulation. In thrush, the lesions are situated principally on the mucous membrane of the inner surface of the cheeks, though they may be also on the tongue and fauces. The breath is offensive. The tongue is indented and puffy.

*Kali chloricum* has an even wider sphere of utility in stomatitis than Borax, being adapted to all varieties, though especially to the ulcerative, in which disease it is, as already stated, a specific. It is especially indicated

when there are pain and tumefaction of the salivary glands without excessive secretion. In the aphthous variety it is often prescribed empirically. The tongue is coated white and the saliva is tough, stringy and acid.

*Mercurius* is strongly indicated by its symptomatology in ulcerative stomatitis, though not much used because of the good results attained by Kali chloricum. It is indicated by the profuse salivation, swollen tongue taking the imprints of the teeth, deep ulcerations with dirty lardaceous base, salivary glands swollen and painful, diarrhœa with greenish stools, erythema of the buttocks, and rapid emaciation. The distinction that has been made between Mercurius and Kali chloricum is that the former remedy is adapted to much the severer class of cases.

*Hepar sulphur* is the principal remedy in mercurial stomatitis. It is also indicated in aphthous pustules on the mucous membrane of the lips, cheek, and tongue.

*Nitric acid* is indicated in ulcerative stomatitis, whether idiopathic or dependent upon the excessive action of Mercury. The ulcerations are well developed; the teeth are loose; fœtor is marked; pains are of a stinging or splinter-like character. The gums are swollen, white, and bleed easily. It may be useful in non-ulcerative lesions, there being blisters or vesicles on and around the lips. Salivation.

*Muriatic Acid.*—Marked prostration or constitutional depression is the central indication for Muriatic acid in this as it is in other conditions. The ulcerations are bluish and deep; the ulcerations present a black base and dark everted edges. The mucous membrane of the mouth presents an inflamed appearance, and is denuded of its epithelium. Salivation is profuse; the salivary glands are swollen and tender; the breath is fœtid.

*Sulphuric acid* is indicated in aphthous stomatitis. The gums are swollen and bleed on slight manipulation. Other symptoms include ecchymoses, profuse salivation, and great weakness. The mouth and tongue are covered with blisters, the breath is offensive, and the gums are white. This and the other acids are important remedies in the sore mouth of scurvy.

*Belladonna* is the principal remedy in simple stomatitis when of a high grade, whether or not the condition is symptomatic of the exanthemata. The onset of symptoms is very acute; local heat and burning are great. Ordinarily, in the Belladonna case, the mouth is dry. Nevertheless, the remedy may still be indicated when the mouth contains a profuse thick or viscid mucus. With the above symptoms it may also be indicated in aphthous stomatitis.

*Argentum nitricum* owes most of its reputation to its local action. Still it is a remedy of considerable value when administered internally. It is indicated in ulcerations (usually aphthous or herpetic) occurring in nervous or dyspeptic subjects, especially if flatulence is a prominent feature.

*Baptisia* is useful in mercurial, ulcerative, and gangrenous stomatitis;

also in the sore mouth of nursing women. It is the main remedy in the aphthous sore mouth attendant upon the late stages of pulmonary tuberculosis, Bright's disease, and other fatal chronic illnesses. The characteristic symptoms include great fœtor of the breath, bleeding from the gums, which are dark or purplish; tongue yellow or brown in the centre, and red along the edges; diarrhœa, offensive stools; patient can take liquid foods only.

*Arsenicum album* is the principal remedy, if indeed not the only one, capable of having any decided influence over malignant ulcerations of the mouth. Pains are violent and of a burning character. It may also prove curative in ulcerative lesions presenting a disposition to gangrene. The patient is restless and much exhausted. In cases of aphthæ, the lesions are livid or bluish and the gums livid and bleeding.

*Arum triphyllum* is indicated in catarrhal and aphthous stomatitis, the keynote symptom being the irritating character of the discharges from the mouth. The mucous membrane of the mouth is painful, the sensation being as if raw or denuded. The parts about the mouth, as the lips and nose, may be chapped and bleeding, and are covered with scabs or excoriations. The parts are very sensitive to manipulations.

*Bryonia alba* is useful in catarrhal and aphthous stomatitis. The mucous membrane of the mouth is abnormally dry; so dry, indeed, that it must be moistened before the child can take the nipple.

*Hydrastis canadensis* is a very valuable remedy in the ulcerations of the mouth attendant upon chronic digestive disturbances. It is also useful in stomatitis materna, mercurial stomatitis, and in aphthæ. The characteristic symptom is the free production of mucus. Hydrastis is useful both externally and internally.

Additional remedies to be recommended for **aphthæ** include *Salicylic acid, Lycopodium, Lachesis, Phytolacca, Natrum hypochlorosum, Helleborus* (with yellowish raised edges), and *Chlorine.*

## Actinomycosis.

The treatment of this is entirely surgical. Success is to be expected when organs inaccessible to the knife are not also involved. The treatment consists of excision, incision or curettement, according as the lesions are tumors, abscesses, or ulcerations. If the first operative procedure is not completely successful it should be repeated. The treatment must be undertaken promptly, for if neglected the disease will extend along the spheno-maxilliary fossæ and invade the cranial cavity. The operation wounds should not be closed, but packed with iodoform gauze. Careful search should be made for sinuses, and if found they should be laid open and cleaned. Iodide of potassium should be administered as in actinomycosis of internal viscera.

## Leukoplaka.

According to Fournier, this lesion becomes carcinomatous in 30 per cent. of the cases; hence, early surgical treatment is demanded. The smooth scar following the excision or scraping is never as annoying as the original lesion. Cauterization by chromic acid and other escharotics never gives as good results as purely surgical measures. The after-treatment consists of the usual antiseptic mouth-washes.

## Sprue.

(*Tropica aphthæ; psilosis; stomatitis intertropicæ; psilosis linguæ; diarrhœa alba; white flux; white purging.*)

The treatment of sprue is mainly dietetic. In the beginning of the treatment a strict milk diet is essential. The patient should start with relatively small quantities, say from two to three pints daily, which may be gradually increased until he is taking from four to seven pints daily. It is very important that it be taken slowly and in small quantities. Scheube is very strong in pronouncing his opinion that the milk should be boiled; Fayrer and Roux, on the other hand, favoring very fresh and unboiled milk. When the patient cannot take the plain milk it should be diluted with lime water or carbonated water. In cases in which it cannot be tolerated by the patient, then he should be fed on gruels or paps made with arrowroot, sago, tapioca, rice, or barley.

After the case has improved under the above line of treatment the diet may be changed to thin broths, beef tea, meat juice, soft-boiled eggs, and raw scraped meat. With still further improvement sweetbreads, poultry, raw scraped ham, toast, stale bread, spinach, puree of potato, carrots, asparagus, and farinaceous foods may be ordered. The contra-indicated foods and drinks include salt and highly-seasoned food, wines, spirits and coffee. These dietetic directions must be persisted in for a long time, and require great fortitude on the part of the patient, for relapses are very prone to occur from slight indiscretions.

Van der Burg recommends a plan of treatment which is rather startling when one considers the symptomatology of the disease. It is a plan that is much practiced in the Dutch Indies, and is known as the fruit cure. The patient is ordered to take fruits in large quantities, but especially strawberries, apricots, peaches, apples, pears, grapes, bananas, melons, pumpkins, and the juice of oranges. Sour fruits are forbidden. Scheube remarks concerning this treatment that it is to be tried only when other methods have signally failed.

Auxiliary methods of treatmeut include absolute rest and the maintenance of the bodily heat. The patient should be kept at rest, preferably in bed. He should wear an abominal binder, and his clothing must be

sufficiently heavy to protect him from inclement weather. The drugs that have been recommended by old-school physicians include mainly Bismuth and Opium. Vegetable charcoal should be administered in material doses to relieve flatulence.

The mouth should be treated locally by such washes as 1 per cent. carbolic acid solution, chlorate of potash, silver nitrate, or crystals of cupric sulphate. Van der Burg recommends rinsing the mouth with a tincture made from the rind of the *Pterocarpus indicus.*

I know of no homœopathic literature concerning the treatment of this disease. Any remedies administered must be selected on a symptomatic basis.

### Ranula.

The treatment of ranula is entirely surgical. When possible the walls of the cyst should be dissected out; but when this cannot be done, a goodly sized portion of the cyst wall should be excised and the cavity packed with borated gauze.

### Ptyalism.

(***Salivation.***)

The treatment of ptyalism is mostly that of the disease or condition which has given rise to it, *e.g.*, the various forms of stomatitis. Measures for cleansing the mouth are always grateful.

Special remedies for ptyalism include *Mercurius, Nitric acid, Jaborandi, Euphorbium, Hydrastis, Borax,* and *Kali hyd.*

*Helonias, Jaborandi,* and *Iris* have been recommended for the ptyalism of pregnancy. Personally, I have found all drugs useless. Patients obtain some relief from chewing a pure gum (Spruce gum).

Although *Atropia* has as its physiological action the diminution of the salivary flow, it is not at all satisfactory in its results. The dose ordinarily recommended is $\frac{1}{100}$ of a grain twice daily. This cannot be maintained for any length of time, because of its effects on the ciliary muscle.

### Glossitis.

The treatment of glossitis depends very much upon the character of the inflammation and its extent. In acute superficial glossitis, the natural tendency of the disease is towards recovery even without any special therapeutic measures. The indications include removal of the cause, providing it is still active, and the ordinary cleansing mouth-washes.

### Acute Phlegmonous Glossitis.

This is a far more serious matter, as the inflammation may proceed with sufficient rapidity to interfere completely with respiration and deglutition. Prompt treatment is therefore necessary. In addition to the danger of asphyxia, is that of deglutition pneumonia. The patient being unable to

swallow, the saliva stagnates in the mouth and becomes infectious. Ultimately it flows into the respiratory passages, and bronchitis and pneumonia are in turn developed. The treatment should include early and deep longitudinal incision on the affected side of the tongue. In some cases a tracheotomy is essential, to enable the patient to respire safely while recovery from the primary condition is being effected. The result of the incision is almost invariably to bring about a prompt reduction in size of the swollen tongue. The resulting hæmorrhage is readily controlled by packing with iodoform gauze. The auxiliary treatment includes the free use of antiseptic mouth-washes.

Some cases are associated with well-defined induration in the submental region suggestive of suppuration thereabouts. It is then necessary to operate at this point also, the evacuation of the contained pus affording prompt relief. Incisions in this locality are attended by the distinct advantage of thorough drainage and the impossibility of pus and blood finding their way into the air-passages.

### Ulcerations of the Tongue.

If we except the ulcers dependent upon tuberculosis and syphilis, the treatment of which corresponds with similar lesions occurring in the mucous membrane of the mouth, those involving the tongue are mostly traumatic, arising, as they do, from the irritation of ragged or decayed teeth. The *causus mali* is not promptly recognized by the patient, because very little, if any, inconvenience is noted until the ulceration has been in existence for some time. Recovery follows very promptly on the removal of the diseased tooth, even though the ulceration presents very ugly objective features. Internal medication is unnecessary. Local cleansing measures hasten the cure.

The remedies indicated in the treatment of the different varieties of glossitis are mostly those adapted to inflammations in general, and include *Aconite, Belladonna, Mercurius, Rhus toxicodendron, Cantharis, Hepar, Kali hydriodicum, Apis mellifica, Arsenicum album, Mercurius biniod.*, and *Argentum nitricum.*

The local pain may at times be so great as to demand analgesic treatment. We may then have recourse to Morphia in extreme cases. Sufficient of the drug should be given to ameliorate the pain. If a stuporous condition is produced, the accumulation of discharges in the mouth and leakage into the respiratory tract is favored. Applications of Cocaine and Eucaine may be made to the inflamed structures just before eating. The diet, it is unnecessary to state, must be entirely of liquid character.

### Geographical Tongue.

The majority of cases of this character recover spontaneously in a short time. Occasionally it is persistent. In the latter class of cases a careful study is necessary to determine the etiological factor, whether syphilis—a very rare cause—dentition, aphthous stomatitis, etc. Whatever study we make into its etiology, we must bear in mind its extreme rarity in subjects past six or seven years of age.

The remedies indicated by this symptom, *i. e.*, mapped or geographical tongue, are *Taraxacum*, *Rhus tox.*, and *Arsenicum.*

### Glossodynia.

This affection must not be confounded with neuralgia involving the lingual nerve. The latter is usually a part of a neuralgia involving other branches of the trigeminus, *e. g.*, tic douloureux, and is to be treated accordingly. Glossodynia is a condition which occurs in hypochondriacal or hysterical subjects, is attended by no objective symptoms, and is characterized by pain (which the patient describes as intense and of a burning character), and is associated with great sensitiveness. The disease is very rare and very resistant to treatment. The treatment which offers the most promise is that relating to the building up of the nervous system, and the internal administration of such remedies as *Ignatia, Belladonna, Arsenic, Actea racemosa*, etc.

### Lingua Nigra; Black Tongue; Hairy Tongue.

This affection is not of a serious nature. When treatment is necessary the affected part should be thoroughly scraped, after which the regular antiseptic measures applicable to the mouth must be instituted.

# CHAPTER VI.

## DISEASES OF THE UVULA, TONSILS AND PHARYNX.*

### Uvulitis.

(*Inflammation of the uvula; acute inflammatory œdema of the uvula.*)

INFLAMMATION of the uvula is a rare condition aside from traumatism and its association with inflammation of the adjacent structures of the pharynx. It sometimes occurs as a manifestation of some constitutional or general disease, to which we are obliged to direct our main therapeutic measures. These constitutional diseases include rheumatism, gout, syphilis, tuberculosis, nephritis, rachitis, and gastric disorder.

Much, however, can be done in the way of local measures, including especially the frequent spraying of the parts with ice cold water. When the uvula is so swollen as to interfere mechanically with the deglutition, it may be reduced in size very promptly by multiple punctures. To avoid damaging the pharynx when performing this little operation, it is a good plan to hold the blade of a retractor back of the uvula. Following the puncture, the local application of glycerin solution of *Zinc chloride* (gr. x–℥j) or *Tannic acid* (grs. x to xx–℥j) will prove useful.

Internal medication must depend very largely upon the patient's constitutional state. According to the local manifestations, one of the following remedies should be selected.

Marked œdema calls for *Apis, Arsenicum, Capsicum, or Rhus. Apis* is indicated more particularly in those cases in which the inflammatory features of the case are but slight. Also when with the œdema the parts are very red and shiny with marked soreness and sharp, stinging pains.

*Arsenicum* is to be administered when the œdema is part of a general œdema, as in the case of chronic nephritis or heart disease. There are thirst and general restlessness.

*Kali bichromicum* and *Kali hydriodicum* are useful in the syphilitic cases.

*Rhus tox.* is to be administered in uvulitis occurring in rheumatic subjects.

*Capsicum* is indicated in cases presenting dark redness associated with the characteristic burning in the parts.

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* In the preparation of this chapter the author wishes to acknowledge the kind and helpful criticisms of Dr. H. S. Weaver.

*Guaiacum* has the bright redness simulating Belladonna, but it lacks the constitutional disturbance of that remedy. It is useful in cases presenting a rheumatic history, and in myalgia especially involving the neck.

Amputation of the uvula is never indicated in this disease.

### Chronic Uvulitis.

This condition is practically always a part of a chronic inflammatory process of the pharynx and adjacent structures. Its treatment is to be regulated accordingly.

### Elongated Uvula.

(***Chronically relaxed uvula.***)

This condition, which is very frequently maltreated, in that in altogether too many instances the uvula is amputated without any attempt being made to restore it to its normal condition by less heroic measures. The causative factor is a very important element in treatment, in that the uvula may be relaxed as the result of general anæmia, post-diphtheritic paralysis, chronic pharyngitis, and tumors distorting the palate and forcing the uvula to occupy a lower position than normal.

The treatment of the paralytic cases demands the general and local measures advised in the article on Diphtheria.

The anæmic cases require good feeding, rest, fresh air, and *Ferrum redactum*, *Arsenicum*, or *Cinchona* internally.

The local application of astringents is of some assistance in giving the patient temporary relief. Those which have been recommended include *Glycerin tannate* (Tannic acid 1 part to 30 parts of Glycerin), *Silver nitrate* (grs. xx–℥j), and Tinc. chloride (grs. x–Glycerin, ℥j).

When the low position is dependent upon pharyngeal growths, the removal of the latter is indicated, but the operation should not be attempted by a general practitioner—only by a throat specialist—as the technical difficulties are at times great.

All the ordinary measures failing, the end of the uvula may be removed. Specially devised uvula scissors make this very easy of performance. The recommendation that only the tip of the uvula be removed is too often honored in the breach than the observance. Careless practitioners are only too prone to remove the uvula to its very line of attachment to the soft palate.

### Ulcerations of the Uvula.

Uvular ulcerations may be due to tuberculosis, syphilis, or the various specific infections. The local treatment includes mainly such measures as are necessary for cleanliness, as applications of Hydrogen dioxide or gargling with Dobell's solution or Glyco-thymoline. Following the thorough

cleansing, stimulating applications, such as *Silver nitrate* (gr. x to xl–℥j) or *Glycerole of iodine*, should be made.

Internal treatment should be given according to indications.

### Neuroses of the Uvula and Soft Palate.

The true neuroses of the soft palate and uvula include a variety of morbid sensations (**paræsthesiæ, hyperæsthesia,** and **anæsthesia**) of the parts. The paræsthesiæ are the ones with which we meet most frequently in practice. They are observed almost exclusively among hysterical females, and demand great tact and firmness on the part of the practitioner for their cure. Usually some psychic influence effects a cure when least expected.

**Chorea** of the muscles of the fauces (so-called) is very uncommon. It is, however, a very annoying affection, and is treated according to the general directions laid down in the article on Chorea, together with such remedies as *Arsenic*, *Agaricin*, *Mygale*, and *Hyoscyamus*.

**Paralysis of the Soft Palate and Pharynx** is due almost invariably to diphtheria. It may also be due to progressive bulbar palsy, syphilitic lesions, hæmorrhage, embolism, tumor, and endarteritis involving the medulla. The treatment is regulated accordingly.

### Acute Catarrhal Tonsillitis.

**Prophylactic Treatment** is a matter for serious consideration for those patients who have frequent attacks of this and other varieties of tonsillitis. The etiology of the disease must, therefore, be borne in mind. The majority of cases are dependent upon exposure to cold or to sudden changes in weather. Some, probably far more than we realize, are due to chemical, thermal, and mechanical irritation of food. Necessarily such cases must be attended by gastric disorder, which in turn reacts upon the throat, making it even more susceptible than before. Prophylaxis then demands that the patient be properly hardened by hydriatric measures, especially by cold sponging in the morning, followed by brisk friction; that he wear suitable clothing, avoiding that which is too heavy as he would that which is too light; and that he pay attention to common sense principles in the taking of food.

**Treatment.**—Acute catarrhal tonsillitis runs its course in a very few days; hence, the simplest medical treatment will suffice. The patient should be confined to his house, and if the fever is at all marked he should go to bed. In the case of children, who constitute the majority of the victims of this disease, confinement in the house is absolutely necessary.

Locally, the simplest measures only should be enforced. Any one of the following gargles may be advised: Equal parts of alcohol, glycerin and water; potassium permanganate, 1:2,000; equal parts of hydrogen peroxide and water; plain ice water.

The assertion has been made that acute catarrhal tonsillitis can be aborted by the early administration of an active purge and the painting of the tonsils with pure Guaiacol three times at intervals of three hours. The Guaiacol is applied on a tightly-wound cotton probe. Care is observed that all excess of medicament is squeezed out of the cotton before making the application in order to avoid flooding the throat with Guaiacol. Energetic treatment of this kind is hardly practical, excepting in the cases of professional singers and speakers who must fulfill their engagements. Even with them, it is an open question as to the advisability of taking the needed rest instead of working under what might well be called artificial conditions.

In the beginning of most cases, when fever is present, *Aconite* is the best remedy.

*Guaiacum* is the favorite remedy of physicians of both schools. Other remedies which may be indicated include *Belladonna, Capsicum, Gelsemium, Mercurius biniodid., Hepar, Mercurius vivus.*

## Follicular Tonsillitis.

(***Lacunar tonsillitis; cryptic tonsillitis.***)

Follicular tonsillitis depends in a measure at least upon infection. It is advisable, therefore, slight though the danger may be, to take proper precautions to prevent the transmission of the disease.

The early symptoms, including as they do high fever, general prostration, and ofttimes severe aching, cause the patient to take to his bed. It is at this time that *Belladonna* is unquestionably the most efficient remedy. Many physicians are in the habit of alternating *Belladonna* with *Mercurius biniod.* 2x at this time. This has been my practice excepting in the rare instances in which there are no well-defined indications for other remedies. Other medicines that enjoy a high reputation in follicular tonsillitis are *Phytolacca* and *Ignatia*, Ivins and Goodno regarding the latter as the most important remedy for the fully established disease.

Locally, it is a very good plan to remove the accumulated secretions from the tonsillar crypts, after which the tonsils should be thoroughly cleansed with Hydrogen peroxide applied on a cotton probe. For the comfort of the patient it is well to perform this little operation after anæsthetizing the tonsils with a 4 per cent. solution of Cocaine.

When, as will sometimes happen, the general pains are very severe, it is a good plan to give a single dose of *Acetanilid*, 5 grains.

The diet should be of liquid character until the fever subsides; after which there may be a gradual return to the usual dietary.

Gargles, as recommended in the article on Acute Catarrhal Tonsillitis, are indicated and prove acceptable. Externally, much relief is afforded by the cold wet compress around the throat. This should be changed every hour or two.

## Suppurative Tonsillitis.

(*Quinsy; tonsillar abscess; peritonsillar abscess; peritonsillar phlegmon.*)

The most efficient local treatment is the application of cold externally to the neck by means of the Leiter coil. If this is not available, then ice cold compresses changed frequently should be used.

For internal local treatment, much has been said of the value of steam inhalations. Theoretically, these would seem to be of value; but practically, the trouble and annoyance they give the patient far outweighs any resulting benefit.

The best local medicament is Guaiacol applied after the method of Lennox-Browne. The formula is as follows:

Guaiacol,
Ol. Amygdalæ dulcis, . . . . . āā fl. ℥ss.

This is applied with a cotton probe to the inflamed tonsils, and while at first it produces some smarting, the latter soon gives place to a distinct anæsthesia, and inflammation ofttimes rapidly subsides.

If there is much accumulation of secretions in the throat, gentle spraying with Dobell's solution, Glyco-thymoline, or diluted Hydrogen peroxide will be of service.

The patient is usually sufficiently sick to take to his bed. Even though he is not thus inclined, it is wise to insist upon absolute rest, as sequelæ are altogether too common after suppurative tonsillitis to permit of any carelessness in details.

The diet is necessarily liquid. It may be hot or cold according to the desires of the patient. The sucking of pieces of ice is beneficial to many patients.

*Belladonna* is the principal remedy in the beginning of acute suppurative tonsillitis, being indicated by the high fever, the intense soreness of the throat, and the acute inflammatory swelling of the tonsils. The majority of cases, however, come under the treatment when the Belladonna stage has passed, and suppuration has begun or is impending. It is then that we must prescribe *Hepar Sulphur*, which may be given in tablets of the 2x trituration every one or two hours. Practically, physicians will scarcely ever be obliged to resort to any other than these two remedies, though he may find use for *Mercurius*, *Silicea*, *Mercurius biniod.*, *Mercurius protoiod.*, *Baryta iod.*, *Iodine*, *Sulphur*, *Calcarea carb.*, *Calcarea iod.*, and *Lycopodium.*

Dr. H. S. Weaver places great dependence upon *Guaiacum* 1x and *Hepar* 2x given in alternation every hour. If there is associated œdema, he advises *Apis* and *Guaiacum* in alternation and says that they will prevent suppuration in many cases.

When it is evident that suppuration has taken place, a careful observation should be made to determine precisely where the abscess points and the most dependent portion of the purulent accumulation. The abscess should then be opened with a small bistoury, which should be wrapped to within half an inch of its point with adhesive plaster or absorbent cotton. The incision should always be made from without inwards, *i.e.*, from the direction of the tonsil to the pharynx. The opening tends to heal very rapidly; hence the physician should keep it patulous by the daily introduction of a probe.

### Mycosis Tonsillaris.

This is such a very rare affection that it might well be regarded as unworthy of study in a general text-book. Inasmuch as it has been my misfortune to meet with such a case and that too in the midst of an institutional outbreak of follicular tonsillitis and diphtheria, and failed to recognize it as promptly as I should, I feel that its treatment should be presented. The best treatment, which is practically all local, is the application of Lennox-Browne's Pigmentum Guaiacol (*vide* p. 296).

Another plan of treatment includes the local cleansing of the affected parts with peroxide of hydrogen, followed by the application of tincture of Iodine to the diseased areas. Or, the parts may be cocainized and the galvano-cautery applied to the spots.

### Hypertrophy of the Tonsils.

When tonsils are sufficiently hypertrophied to demand treatment it is almost certain that their removal is necessary. The old view which relegated all cases of this condition to the guillotine has been modified in later years, inasmuch as it has been discovered that much of the discomfort attributed to hypertrophied tonsils is in reality dependent upon the existence of post-nasal adenoids, the latter alone requiring attention. In the presence of tonsillar hypertrophies, the questions demanding consideration are, first, Does the enlargement of the tonsils produce any discomfort; and, secondly, Is the enlargement of the fibrous variety? Answering these in the affirmative, abscission is indicated.

Enlargement of the tonsils is especially common among young adults and children, and yet but few of these cases ever demand surgical interference. Attention to matters relating to general hygiene, as plenty of fresh air, good food, etc., serve to bring about a practical cure. This may be assisted by remedies, the principal of which are *Baryta carb.*, *Baryta iod.*, *Mercurius biniod.*, *Merc. iod. cum Kali iod.*, *Ferrum iodide*, *Hepar sulphur*, *Sulphur iod.*, *Calcarea iod.*, *Calcarea phos.*, *Hydriodic acid*, *Aurum mur.*, *Arsenicum iod.*, and *Graphites.*

In those cases of enlarged tonsils in which the glands present a spongy appearance with nodular or pedunculated projections, the best plan is to remove these by suitably constructed scissors.

The enlarged fibrous tonsils can be treated only by excision. Objection to this operation has been made because of alleged sequelæ and the danger of hæmorrhage. Experience has shown that many of the fears referred to are utterly groundless, if not actually absurd. It is true that the tonsils are glands having a physiology and should be preserved whenever possible. But this position cannot be maintained when the glands are in a pathological state and act as a mechanical obstacle to healthy deglutition and phonation.

The danger of hæmorrhage is very small. Most of the serious cases of this accident have occurred after removal with the bistoury instead of the guillotine. The probability of its occurrence is still further increased by the injudicious removal of too large a portion of the glands. Ordinarily, the object of the operation will be accomplished by slicing off but a small piece. The development of cicatricial tissue in the course of the subsequent healing will bring about still further reduction in the size of the tonsils. The greatest care must be exercised not to injure the faucial arches.

### Tumors of the Tonsils.

**Benign tumors** of the tonsils should be excised as soon as possible after their existence is recognized. Delay is inexcusable, because their presence acts mechanically as a foreign body to maintain more or less mechanical irritation, to say nothing of retention of secretions and a foul breath. An early operation is also safer of execution and less dangerous than a late one.

**Malignant tumors** of the tonsils are practically all inoperable so far as any expectation of radical cure is concerned. It is true that we may give the patient considerable comfort by judicious excision of portions of the tumor or applications of the galvano-cautery. The results of the radical operation, which includes resection of the jaw, are not such as to lead us to recommend it to our patients. We are justified in trying the various debatable treatments of malignant growths, as X-ray, the injection of Coley's fluid, etc.

To relieve pain, we may make local applications of *Cocaine* or *Eucaine* (5 per cent. to 10 per cent. solutions). Lennox-Browne recommends that the patient be indulged in *opium smoking*, one grain of the powdered drug being mixed with each pipeful of tobacco. He declares that it is a most efficient anodyne.

A very important part of the treatment is the regulation of the horrible odor which is given off by the patient. This may be accomplished to a certain extent by the use of antiseptic mouth- or throat-washes consisting of *Hydrogen peroxide* or *Permanganate of Potassium.*

## Post-Nasal Adenoids.

(*Hypertrophy of the pharyngeal tonsil.*)

Post-nasal adenoids constitute a condition which may—indeed frequently does—give rise to serious sequelæ. Hence, their removal is frequently called for. Unfortunately, faddists are running this subject into the ground, so that many patients are subjected to the operation without the slightest necessity therefore. I have no doubt that a skilled (?) palpator can find enlarged pharyngeal tonsil all but universal. This faddism is a serious matter, as it will lead the conservative element of the medical profession to take an extreme ground against what is really a most useful procedure. The indications for the operations I would epitomize as follows :

1. Mouth breathing, of which it is the most frequently observed cause.
2. Asthma, emphysema, recurring and persistent attacks of bronchitis.
3. Deformities of the dental arch.
4. *Persistent* naso-pharyngeal catarrhs in childhood.
5. Aprosexia.
6. Otalgia followed by deafness, temporary or otherwise.

## Caseous Tonsillitis.

The treatment of this affection is purely mechanical. The affected crypts should be thoroughly opened by incision, their contents evacuated by a dull curette, and their walls treated to an application of *pure* Carbolic acid on a cotton probe, care being observed that the excess of acid is first squeezed out of the cotton to prevent its running over the normal throat tissues. Instead of this the crypts may be treated with the galvano-cautery point heated to a cherry-red.

## Herpetic Tonsillitis.

The treatment of this affection will be considered under Herpetic Pharyngitis.

## Diseases of the Lingual Tonsil.

The lingual tonsil is subject to all the pathological conditions which may invade the faucial glands, including acute and catarrhal inflammation, lacunar involvement, hypertrophy, malignant disease, suppuration, etc. The treatment of these is identical with that already advised in the case of the pharyngeal tonsillar affections. Suppurative inflammation is apt to be more rapid in the lingual tonsil, and if the abscess is to be opened, prompt action must be taken. Usually it opens spontaneously. Hypertrophy is to be treated by excision, but requires a special guillotine.

## Acute Catarrhal Pharyngitis.

(*Acute sore throat; angina simplex; simple acute pharyngitis.*)

The majority of cases of acute catarrhal pharyngitis are due to exposure to cold. These require no general treatment other than the administration of medicines prescribed according to the symptoms. A respectable minority of the cases have some constitutional cause as an underlying condition, as gout, rheumatism, tuberculosis, syphilis, chlorosis, and gastro-intestinal disturbances. In the latter case, medicines and hygienic regulations must be prescribed accordingly.

Most cases—probably all—of acute catarrhal pharyngitis need no other local treatment than the simple gargles and sprays recommended for catarrhal tonsillitis. The catarrhal inflammations of the acute infectious diseases usually do very well on some simple antiseptic mouth-wash and gargle, while remedies are administered for the primary complaint.

Externally, we should apply the cold wet compress as already recommended (*vide* p. 294) for acute tonsillitis.

It should be remembered that too energetic local treatment of a throat acutely inflamed violates the principles of rest, and is not to be countenanced unless we have decided indications for such measures.

The majority of cases yield very promptly to the administration of *Belladonna*, *Guaiacum*, or *Gelsemium*.

*Belladonna* is indicated in cases presenting the local evidences of an active inflammation; mucous membrane of the pharynx is bright red and swollen; pains are quite severe, and are worse on swallowing; fever is high; the feet are cold; and the cervical glands are swollen and tender.

*Gelsemium* is used as an empirical remedy by many physicians in acute catarrhal pharyngitis as in acute rhinitis, the dose being one drop of the tincture every hour.

*Guaiacum* was recommended by Goodno* as a specific, he claiming that it is far superior to Belladonna and other remedies ordinarily prescribed by physicians of our school. He advised discs saturated with a good tincture, and these should be permitted to dissolve on the tongue.

*Dolichos* was recommended by Korndœrfer† in cases of pharyngitis presenting as a prominent feature "pain as from a splinter near the right tonsil, worse when swallowing."

*Amygdala persica* has likewise been highly extolled by Korndœrfer in his clinical lectures as useful in cases presenting "soreness and aching pains but without any characteristics calling for other remedies." This observation was originally made by Dr. Jacob Jeanes.

*Apis mellifica* has as its characteristic symptoms the pinkish red swell-

* *Hahnemannian Monthly*, February, 1891. † *Hahnemannian Monthly*, June, 1890.

ing of the throat; œdema, especially of the uvula; burning, stinging pains; difficult deglutition and respiration.

*Ammonium mur.* is the remedy in cases attended by an accumulation of viscid phlegm, with sensations of rawness in the naso-pharynx and pharynx.

*Aconite* is undeservedly neglected as a throat remedy. It is suited to many cases of acute pharyngitis attended by stiffness of the neck, and fever with dry skin.

*Lachesis* is called for in cases in which the subjective symptoms are disproportionately severe to the objective appearances. The patient complains of a sensation of dryness and fulness in the throat; tries to expectorate, but nothing comes up; sense of constriction; throat dry, shining, dusky red.

*Argentum iod.* was highly praised by Hale,* on the following indications: "Swelling in the submaxillary gland region; difficult deglutition; has to force food down; viscid, gray, jelly-like mucus, easily expectorated early in the morning; throat raw and sore; when yawning, painful tension in the fauces; constriction in the throat, impeding deglutition; ulcer in the throat, with swelling of the glands of the neck."

*Phytolacca* has some reputation for cases occurring in rheumatic subjects. The pharyngeal mucous membrane presents a dry, irritable appearance; constant desire to clear the throat of mucus; sense of dryness and roughness in the pharynx; general soreness of the posterior fauces and extension of the irritation into the Eustachian tubes.

*Capsicum* is useful in cases occurring in relaxed throats. The fauces and pharynx are dusky red, and the uvula elongated and œdematous. This drug may also be used locally as a gargle, one drachm of the tincture being dissolved in a half pint of water, but its use must be confined to the early stages. *Rhatania* may also be used in relaxed states of the throat.

### Traumatic Pharyngitis.

In a general way, the treatment of acute traumatic pharyngitis coincides with that of the acute catarrhal variety. There is, however, this important distinction, the necessity for avoiding infection of the pharyngeal wounds and the spread of the same to adjacent structures. When a foreign body is the cause, it is necessary that it be located and removed promptly. At the same time, when the swelling is extreme, it is unwise to increase the local traumatism by ill-judged attempts in searching for it. In the majority of cases, the history shows that the foreign body has been removed before the physician is consulted.

Antiseptic applications are of special importance. The one which gives the best results is the application of carbolized vaselin, to which has been added Menthol in the proportion of four grains to the ounce. This

* *Transactions of the American Institute of Homœopathy*, 1889.

also serves to give relief to the pain, especially in cases that have been produced by burns and scalds.

We may also use as local sprays the standard *Adrenalin* solution plain or diluted with five to ten parts of saturated solution of *Boric acid*, or the following:

| | |
|---|---|
| Menthol, | gr. x. |
| Ac. Carbol., | gr. v. |
| Ol. Eucalypt., | ℥ss. |
| Cocain, | gr. ij. |
| Glycolin, | ℥ij. M. |

S.—Spray every hour or two until pain and swelling subside.

If the inflammatory condition is of high grade, the iced compress externally or the Leiter tube is invaluable.

Localized œdema must be managed according to its distribution. When in the pharynx alone, multiple incisions will suffice; when it invades the larynx it may be necessary to perform tracheotomy or intubation.

Of other local applications, there may be tried permanganate of potassium sprays, Hydrogen dioxide, or Pyoktanin and glycerin (1 : 100.)

The internal medicines for this condition include *Aconite*, *Arnica*, *Belladonna*, *Calendula*, *Ferrum phos*, *Hepar*, and *Staphisagria*.

If pus forms, early evacuation must be made. As a rule, this should be done by an internal incision, though in the case of large abscesses the incision should be from the outside.

### Acute Follicular Pharyngitis.

The local treatment of this disease is comparatively unimportant. Sprays of iced water, weak, oily solution of Boric acid or Menthol, and the cold compress externally are about all that is needed; and even these are not used by the majority of practitioners.

The internal medication of this disease is well presented by H. S. Weaver,* as follows:

*Belladonna* 2x or 3x.—The whole throat is a very bright red, usually worse on the right side. Intensely raw irritated sensation, worse when swallowing, but also quite painful during the interval of the deglutition. Constant desire to swallow; liquids cause more pain than solids; face red, eyes congested, headache, usually throbbing in character, and worse in the frontal region; general systemic disturbances with the usual malaise, backache, throbbing pulse, etc.

*Guaiacum θ* or 1x.—The symptoms calling for this remedy are very similar to those of Belladonna, but lack the constitutional disturbance always found in patients needing Belladonna. Aching in the throat and muscles of the neck; great tendency to hold the muscles of the neck when speaking to relieve aching and tired feeling; some rheumatic history.

* *Hahnemannian Monthly* October, 1905, p. 724.

*Capsicum* 3x or 6x.—Throat red like Belladonna, but has more of the burning and stinging pains with less febrile disturbance; inclination to drowsiness; exposure to the cold atmosphere aggravates; tongue coated white; the faucial tissues are more baggy and slightly darker than found under Apis. Intense burning is a great characteristic of this remedy.

*Apis mellifica* 6x.—Red and œdematous uvula and soft palate, with blister-like swellings over the uvula and soft palate, which are filled with a serous-like fluid; breathing at times labored, voice indistinct; swallowing difficult and very painful, owing to the œdematous swelling. If Apis were prescribed in more cases than Mercurius iod. rub., which seems to be the first remedy thought of by most physicians, the patient would make a quicker recovery.

*Mercurius corrosivus* 3x or 6x.—Soreness, especially severe in the post-nasal space, with pains shooting up towards the ears; parts are less red than in Belladonna with the desire to cough; throat feels dry and stiff.

*Lachesis* 30.—Throat is dark purple, livid color, usually worse on the left side, and there is a decided constricted feeling; everything around the neck seems too tight, always worse when awaking from sleep.

## Septic Pharyngitis.

(***Gangrenous, malignant, or putrid sore throat; hospital sore throat; ulcerative septic pharyngitis.***)

Under the above titles are included two affections of septic origin. One of these is a comparatively mild affection, especially liable to occur among those working in dissecting-rooms, the constitutional manifestations being much more pronounced than the local. These cases usually get along very nicely under treatment, though removal of the patient from the contaminating atmosphere for a prolonged period, and, better still, to the mountains or seashore is important. Local treatment other than such as is necessary for cleanliness is useless. Internally, *Cinchona*, *Arsenicum iod.*, *Ferrum iod*, and *Strychnia phos.* is required.

The other affection is the true phlegmonous or gangrenous pharyngitis, and offers an absolutely unfavorable prognosis. Both local and constitutional disturbance is profound. Nutritious liquid diet is required so long as the patient is able to partake of the same, the throat being thoroughly cleansed before feeding. Ultimately, rectal alimentation is necessary.

The use of injections of antistreptococcic serum has proven efficient in a few instances in which the infection was of that character.

Locally, the best treatment is the Leiter coil externally, the sucking of ice, and antiseptic sprays.

Incisions are generally regarded as worse than useless, for while they fulfill the indication of relieving tension, the adjacent tissues are all the more likely to slough.

Tracheotomy is often required. Possibly it might prove to be a good plan to do this operation early, and thus cut off from the respiratory tract an area of putrefaction and infection, for many of the cases die of aspiration pneumonia.

Medicines are far from satisfactory, as is all other treatment. Those which may be regarded as worthy of trial include *Arsenicum album*, *Arsenicum iod.*, *Baptisia*, *Echinacea*, *Belladonna*, *Ammonium carb.*, *Silicea.*, *Cinchona*, and *Natrum ars.*

### Hæmorrhagic Pharyngitis.

The initial phenomena in this disease are the hæmorrhagic, and call for such remedies as *Hamamelis*, *Erigeron*, *Arsenicum album.*, *Lachesis*, *Secale*, etc. Locally, when the hæmorrhage is persistent, astringent sprays or applications should be used. It is better by far to make rest the first and best remedy. Later, when acute inflammatory symptoms appear, the treatment does not differ from that required in simple catarrhal pharyngitis, excepting that the depraved constitutional state demands attention.

### Retro-Pharyngeal Abscess.

The treatment of this lesion should be left to the surgeon or throat specialist. It consists in the early evacuation of the pus. This statement is made in full knowledge of the fact that there are some authorities who advise an extreme conservatism in resorting to surgical procedures. Nice judgment is demanded as to the nature of the operation. When an internal incision is indicated the patient should be placed with the head hanging downwards over the edge of a table. The opening should be made in the median line whenever possible, the pus evacuated, and the abscess cavity washed out and curetted.

The external operation is made by an incision along the anterior border of the sterno-cleido-mastoid muscle, and must be performed under ether anæsthesia. These cases are usually those in which the abscess has originated in the lymphatic structures.

When the abscess is due to caries of the vertebræ, the diseased bone must be removed.

Internal remedies include *Hepar*, *Silicea*, *Mercurius*, *Cinchona*, *Calcarea iod.*, and *Strychnia phos.*

### Herpetic Pharyngitis.

(***Aphthous sore throat; simple membranous sore throat; pharyngitis herpetica; common membranous sore throat.***)

Local measures accomplish little or nothing. Steam inhalations relieve the pain in a measure. Permitting tablets of slippery elm to dissolve on the tongue relieves the dryness of the throat to some degree.

*Apis mellifica* is the commonly indicated remedy. Clusters of vesicles filled with clear lymph appear on the walls of the pharynx; the throat is puffy and dry, as if varnished.

*Capsicum* is indicated when there are burning and stinging in the soft palate and fauces.

*Nux moschata*, when there is intense dryness of the entire mucous membranes involved.

Other remedies to be considered include *Aconite*, *Clematis*, *Graphites*, *Iris*, *Natrum sulph.*, and *Staphisagria*.

## Angina Ludovicci.

(***Ludwig's angina; cellulitis of the neck.***)

The treatment of this affection is strictly surgical, the suppurative focus being opened as promptly as possible after discovery.

## Chronic Catarrhal Pharyngitis.

In this, as in most of the chronic affections of the pharynx, the use of alcohol and tobacco serves to aggravate the complaint, even though these habits are not the actual cause of the same. Tobacco in particular is pernicious, and its use should be positively forbidden, even in moderation. Faulty phonation and excessive use of the voice in public speaking are causes in many instances. Under such circumstances, it is essential that the patient take a rest, and before resuming his vocal labors take instruction that he may acquire correct methods.

Theoretically, practitioners and specialists recognize the importance of disturbed functions of the stomach, heart, lungs, and kidneys in the production of chronic disturbances of the throat. Practically, it is but seldom that they give them any attention in the treatment thereof. It is of the greatest importance that all cases be carefully examined for any underlying dyscrasia or organic disease. When such is discovered it *must* be treated. Among the constitutional taints of importance in this respect may be included rheumatism, gout, intestinal auto-intoxication, diabetes, tuberculosis, and syphilis. Some cases appear to have an important relationship to neurotic conditions. In them, the treatment demands attention to the reduction of nerve wear and tear, building up of the nervous system, and regulation of the sexual habits. Still others are purely local, the pharyngeal disease being secondary to a nasal lesion which interferes with free nasal respiration. Such must be corrected before the pharynx can be cured. Finally, some persons are so constituted that they cannot live amidst certain atmospheric conditions without endangering the pharyngeal mucous membranes.

The above-mentioned hints as to the etiology of chronic pharyngeal catarrh offers us invaluable aid in the treatment thereof, both as to general hygiene and the administration of remedies.

Our constitutional treatment can be aided greatly by local measures, the most important of which are those designed to keep the mucous membrane of the throat clean. For this purpose, there is nothing better than the time-honored Dobell's solution or the latter day Glyco-thymoline. These may be used in the form of spray, douche, or gargle.

Following the cleansing of the surface of the pharynx we may apply an astringent or stimulating medicament according to indications. Of the former, the most efficient are *Alumnol* (Beta-naphthol-disulphonate of aluminium) in 1 per cent. solution as a spray; or Protargol (5 per cent.) applied with the cotton probe. The older astringents, as Zinc chloride (grs. x–℥j), Silver nitrate (grs. v–x–℥j.), Glycerole of Tannin, etc., may also be used.

For purposes of stimulation nothing is better than Iodo-glycerin (Iodine tinc., 1 part, to glycerin 5 to 10 parts).

Dr. H. S. Weaver recommends very highly local applications of *Aquus pinus canadensis.*

I have also used with considerable success in cases attended by hypersecretion *Pyoktanin blue.* One-half gramme of this drug is dissolved in two drachms of water. Ten minims of this solution are added to one ounce of pure glycerin. The application is made with a brush or a cotton-covered probe.*

*Hydrastis canadensis* is the most frequently indicated remedy in purely catarrhal pharyngitis. It may be used both internally and externally. Its characteristic is the free production of mucus from the posterior nares, said mucus being tenacious and either yellowish or white. It often proves useful in the so-called dry catarrhs, the pharynx presenting a dry, glazed appearance, or its surface is covered with tough greenish masses.

*Sanguinrina nitrate* 2x is a most excellent routine remedy. Much of the benefit to be derived from it is due to its local action during deglutition. The tablets should be permitted to dissolve on the tongue.

*Kali bichromicum* is especially useful for the hypertrophic forms of pharyngeal catarrh, its special indication being the character of the mucous discharge, which is thick and ropy. The patient complains of roughness and rawness in the throat, worse in the morning.

*Nux vomica* should be prescribed in cases associated with gastric disturbances, and for persons who have been excessive users of alcohol and tobacco. The patient complains of a raw, sore, rough, scraped feeling in the throat; loose cough with thick grayish expectoration; sensitiveness to pressure in the suprasternal notch.

*Penthorum sedoides* is recommended by Champlin† when the posterior nares feel raw, as if denuded; continual feeling as if the posterior nares were moist.

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* *Hahnemannian Monthly,* June, 1891.

† *Medical Advance,* September, 1888.

*Alumina.*—Dry feeling in the throat, especially on waking; sensation as of a splinter in the throat; dropping of thick and tough mucus from the post-nasal space; catarrh of the Eustachian tubes.

Additional remedies well worthy of consideration are *Kali hyd.*, *Mercurius binod.*, *Wyethia*, *Phytolacca*, *Hamamelis*, *Pulsatilla*, *Æsculus*, *Argentum nitricum*, *Calcarea phos.*, *Kali chloricum*, and *Mercurius dulcis.*

## Chronic Follicular Pharyngitis.

(***Granular pharyngitis; clergymen's sore throat.***)

All the constitutional and local measures advocated in the treatment of chronic catarrhal pharyngitis are applicable to the follicular variety. They must, however, be regarded as auxiliary to the necessity of destroying the enlarged follicles. The latter may be accomplished by the galvano-cautery, chromic acid, or puncture with a pointed probe. Judgment and skill must be exercised in the destruction of these follicles, for careless manipulation is capable of producing such excessive formation of cicatricial tissue as to make the treatment worse than the disease. When using the cautery, the knife selected should be one having a very fine point. It should be heated to a white heat, and its point plunged into the follicle with a steady hand, and immediately withdrawn. But two or three follicles should be destroyed at a seance, and those selected should be well separated.

The chromic acid is used in 20 per cent. solution. A minute piece of absorbent cotton is carefully wound about a fine-pointed carrier. The minutest portion of the medicament is taken up by the cotton, and any excess carefully expressed against the lips of the bottle. This prevents spreading of the acid to parts upon which we do not wish the acid to act. Punctate destruction can thus be effectually accomplished. The acid is not as good as the cautery, because in careless hands the destruction of tissue may be greater than intended, and it continues after the probe is withdrawn.

Point puncture is very safe. The probe should not have a cutting edge. A very good plan in using this treatment is to destroy the small bloodvessels entering the follicle.

Stimulating applications are very useful in follicular pharyngitis. One of the best of these is the Iodo-glycerin already mentioned, and with which the entire pharyngeal surface should be swabbed after clearing of mucus.

*Sanguinarina nitrate* 2x was introduced by Owens, of Cincinnati, and is a very efficient remedy.* Ivins speaks of it as his "sheet-anchor in chronic follicular pharyngitis," and the remedy to use in the absence of indications for another remedy. Special indications for it include "burn-

* *Disease of the Nose and Throat*, p. 185.

ing, soreness, rawness in the naso-pharynx and pharynx; discharge of thick, yellow, or even bloody mucus."

*Kali bichromicum* is indicated when there is a feeling of roughness and dryness in the throat and an accumulation of tenacious mucus. The pharynx presents a dry, irritable appearance.

*Æsculus Hippocastanum.*—The patient complains of dry, rough, burning feeling in the pharynx; the face is sallow; digestion is slow; portal congestion, as shown by throbbing in the right hypochondrium; hæmorrhoids; frequent hawking of clear mucus; pharynx and fauces relaxed, swollen and dusky red.

*Nux Vomica.*—Ivins gives the following indications,* which he says are purely clinical, but which he has verified frequently: Atrophic white patches, the size of a split pea, with a few enlarged follicles; as soon as a tongue depressor or mirror is passed beyond the lips the patient gags or retches, but especially for those who have, as a pharyngeal reflex, a laryngeal tickling, augmented by tobacco smoke; persons with gastric disorders and constipation; those who are addicted to the use of alcohol and tobacco.

*Secale cornutum* is not commonly thought of as a remedy in throat affections, but Farrington speaks of it as of possible use in this disease, because it has in its symptomatology the "coughing up of follicular exudates."†

The Iodine preparations are ofttimes of value, especially Arsenicum iod. and Kali hyd. *Arsenicum iod.* is indicated when there is hypertrophy of the pharyngeal tissues with burning, rawness and soreness; excoriating, watery, nasal discharge; especially in tubercular patients.

*Kali hydriodicum* was suggested by Meyhoffer in cases presenting irritation as a leading symptom.

*Wyethia* is indicated in cases in which the mucous membrane gives evidence of undergoing atrophy. The patient complains of dryness, burning, constant desire to clear the throat; pharynx dark red, sensitive; feels swollen; constant desire to swallow to relieve the dryness.

Additional remedies to be considered in the treatment of chronic follicular pharyngitis are: *Ammonium brom., Badiaga, Sepia, Teucrium marum verum, Hepar, Kali mur., Sulphur iod., Cinnabar, Calcarea phosphorica,* and *Kali bromatum.*

## Atrophic Pharyngitis.

(***Pharyngitis sicca.***)

In the majority of cases, atrophic pharyngitis is associated with, if not secondary to, a similar pathological condition in the nasal passages. The first important indication in the treatment is the thorough cleansing of

* *Ibid.*, p. 185.

† *Clinical Materia Medica*, 2d edition, p. 683.

the pharyngeal mucous membranes, which may be done by the use of a simple alkaline wash like Dobell's solution or swabbing the surface with hydrogen peroxide. Following this cleansing, which can never be too thorough, and can scarcely ever be performed successfully by the patient himself, the diseased surfaces should be treated by the application of some stimulating preparation. Care must be observed that the resulting congestion is not of too high a grade. The stimulating applications include Iodo-glycerin, one minim of oil of mustard to the ounce of albolene or liquid cosmolin, crude petroleum, weak solutions of thymol, glycerole of Hydrastis canadensis (1 : 10) and Ammonium chloride, or daily spraying of the throat with the following :

| | |
|---|---|
| Ol. Gaultheriæ, | gtt.j. |
| Menthol, | gr.v–x. |
| Parolene, | fl. ʒij. |

Spraying with some simple bland oil without any medicament in solution is of itself beneficial, though but temporarily so. This is a procedure which the patient should carry out at home. The oils may be any of those well known to the profession, especially albolene, parolene, liquid vaselin, etc.

Mechanical stimulation of the mucous membrane has also been recommended. Vibratory massage requires special apparatus, and while no doubt a good thing, is no better than the manipulation or stimulation performed by gentle friction of the pharyngeal mucous membrane by the cotton-covered probe. The various local treatments above advocated should be made by the physician on alternate days. Between visits the patient may cleanse the parts as best he can with Dobell's solution or Glyco-thymoline. The best methods of home application are probably the Birmingham douche and its modifications, *e. g.*, the Kress & Owen douche.

Success is to be attained only after many months of treatment. Certainly not less than six months will be required. The majority of cases are incurable, and the most that we can hope for is to stay the progress of the disease, or make the patient's existence fairly tolerable.

The patient should also receive constitutional treatment as indicated. The remedies commonly indicated include the various iodides, especially *Kali hyd.*, *Arsenicum iod.*, *Calcarea iod.*, and *Kali bichromicum.* For additional therapeutic hints the reader is referred to the article on Atrophic rhinitis.

## Rheumatic Pharyngitis.

(***Rheumatic sore throat; gouty pharyngitis; rheumatic angina.***)

Local treatment is valueless in this disease. Hygienically, we should prescribe the measures ordinarily indicated in acute and chronic rheumatic affections; such, for example, as a simple diet, free elimination, as by the

hot-air bath, the Turkish bath, the hot wet-pack, the free drinking of the alkaline spring waters, as Vichy (Saratoga or Celestine), and free action of the bowels, especially by the salines, as Sodium phosphate and Carlsbad salts. Internally, we should prescribe *Rhus tox.*, *Colchicine* (gr. $\frac{1}{100}$, *t.i.d.*), *Bryonia*, *Sodium salicylate*, etc.

# CHAPTER VII.

## DISEASES OF THE ŒSOPHAGUS.

### Œsophagitis.

The indications for the treatment of acute œsophagitis are the same as those called for in acute inflammations generally, namely, rest and measures to reduce swelling and pain. The patient should, until all active symptoms have subsided, be fed by the rectum. Later, liquids may be administered, but these should always be given warm. Sometimes the heat increases the distress, in which case cold drinks should be ordered. The latter have a beneficial action on the inflammation.

In œsophagitis sequential to typhoid fever and other infections we are placed at a decided disadvantage. The systemic condition is usually one of prostration, and good nourishment is called for, while the local changes are such as to demand that we feed the patient by the rectum. Although I know of no precedent, it impresses me that when the patient can stand the operation a gastrostomy for artificial feeding purposes will prove to be the best for the patient in the long run, for experience has demonstrated that the post-typhoid ulcerations of the œsophagus are commonly followed by stenosis.

In œsophagitis from poisoning cases, as alkalies and acids, special antidotes may be employed as advocated in works on toxicology.

Internally, we may prescribe *Arnica*, *Belladonna*, *Carbolic acid*, *Arsenicum*, *Kali hyd.*, *Nitric acid*, *Muriatic acid*, *Rhus*, or *Cantharis*.

Hale* especially recommends *Veratrum viride* as capable of producing "an undoubted inflammation of the mucous membrane of the œsophagus, with superficial erosion."

### Œsophageal Hæmorrhage.

The etiology is an important factor in deciding as to the proper treatment of œsophageal hæmorrhage. When dependent upon impacted foreign body, the mechanical problem is usually such a difficult one that the general practitioner will do wisely if he refrains from any active measures and calls in the surgeon. It is very easy for him to make matters much worse by unwise interference. The instrumental means for the removal of the foreign body include the use of forceps by the mouth (a method that demands the nicest kind of manipulation), œsophagotomy, and gastrostomy.

* *New Remedies, Therapeutics*, 3d edition, p. 771.

The most frequently observed cause of œsophageal hæmorrhage is varicose veins at its cardiac extremity, dependent upon cirrhosis of the liver. The treatment in such cases depends upon the enforcement of the same measures as those indicated in gastric hæmorrhage, namely, rectal alimentation for a week or ten days after the bleeding has stopped. For some time afterwards the patient should take only soft foods.

### Œsophagismus.

When œsophageal spasm originates in the hyperæsthesia incident to local lesions, as ulceration or inflammation, the treatment must be directed against these conditions. Remedies capable of lessening the reflex irritability, as *Belladonna*, should be administered.

The hysterical cases are usually much benefited by the regular passage of the tube or sound. Internally, we should administer *Ignatia, Valerianate of Ammonia, Asafœtida, Carbolic acid, Cannabis indica, Gelsemium, Oleum cajuputi,* or *Veratrum viride.*

### Œsophageal Stenosis.

Organic stenosis of the œsophagus is usually dependent upon cicatricial closure. The treatment is strictly surgical. When the case will permit, the systematic use of œsophageal sounds is required. Stenosis dependent upon pressure of mediastinal tumors does not admit of this treatment.

When the stenosis has advanced to the point of undermining nutrition by reason of the small amount of food taken, gastrostomy is necessary. The subsequent management of the case must depend upon the progress of the patient after the latter operation, and the seat and cause of the stricture.

### Carcinoma of the Œsophagus.

The treatment of carcinoma of the œsophagus is strictly palliative, all cases terminating fatally within a year of the appearance of the first symptoms. In some few cases in which the lesion is in the neck excision has been performed successfully; but such cases are decidedly in the minority. The important indication is the preservation of the calibre of the œsophagus in order that the patient may be nourished. In the early stages, the regular use of bougies may preserve the patency of the tube for a time. Such practice is open to the objection of increasing the local irritation and exposing the patient to the danger of perforation. Some success has been attained by the use of the Symond's tube. This is practically an intubation of the stricture. The instrument employed consists of a short tube with a flange at the upper extremity which rests upon the upper limits of the stricture and thus maintains the instrument in place. It is important that threads be attached so that the tube can be removed when indications call for this procedure.

When ulceration has caused a fistulous communication between the œsophagus and the air-passages, *e. g.*, the trachea or one of the bronchi, it is essential that the tube employed shall be sufficiently long to extend well beyond the limits of the pathological process, otherwise food or drink will almost certainly escape into the respiratory tract and thus occasion an aspiration pneumonia. Such precaution, however, can delay the necessarily fatal issue for but a short time, for with such ulceration present, pus and necrotic tissue will certainly bring about the same state of affairs as the food.

The operative procedure that offers the best prospects of success is gastrostomy. Some authorities assert that it should be performed early, and instance the great relief and prolongation of life afforded patients with cancer of the rectum by the making of an artificial anus. The two conditions must not, however, be regarded as strictly analogous, for the growth in carcinoma gulæ is not unlikely to invade very important structures and thus hasten the fatal ending. It would seem that gastrostomy is a humane procedure for a time at least, as it averts death by starvation and thirst. Experience bearing on this subject does not teach us as much as we would like ; for we cannot draw correct conclusions from cases in which the operation has been delayed an unjustifiable length of time, as is usually the case.

If an operation is refused, or is not regarded as advisable, the most that we can do when the stricture becomes impervious is to feed the patient by the rectum and quench thirst by hypodermoclysis.

Special symptoms must be treated on general therapeutic principles.

## Œsophageal Paralysis.

Paralysis of the œsophagus occurring in the course of such organic nervous diseases as disseminated sclerosis, bulbar palsy, tumors, hæmorrhage, and other lesions of the pons, and tabes dorsalis is practically incurable. All that can be done is to save the patient from starvation by feeding through the stomach tube.

In post-diphtheritic paralysis of the œsophagus, there is almost always associated profound cardiac asthenia ; hence, the therapeutic measures should be directed to the conservation of the patient's strength by the enforcement of a rigid physical rest. The illness being an acute one, the patient (usually a child) does not require much nourishment, and that little can be given with less violation of the principles of rest by rectal feeding,

Electricity, which is advised by some authorities, impresses me as likely to do more harm than good.

*Gelsemium*, *Argentum nitricum*, *Strychnia*, *Lobelia inflata* and other remedies recommended as useful in multiple neuritis are indicated.

## Œsophageal Diverticulum.

Diverticula of the œsophagus, whether dependent upon dilatation or traction from lesions outside the gullet, are lesions which should be treated by the surgeon only. Many cases are inoperable, and can only be treated palliatively. In those amenable to operation no set procedures can be decided upon in advance of a surgical dissection, which then reveals the true nature of affairs. Following the determination of the latter, the surgeon must use his individual judgment according to indications.

The results of surgical treatment are apparently good. Zesas* has tabulated 42 cases, of which 34 were cured; 8 died from the operation; in 6 the œsophageal wound healed by first intention; in the remainder, the fistulæ closed in from 4 days to 16 weeks. Experience has taught that the difficulties of the operation are greatly enhanced by the poorly nourished condition of the patient at the time he comes under treatment. Rectal alimentation is necessary for a time, but cannot be continued as long as is desirable.

Small diverticula sometimes disappear completely if the patient is fed by the stomach tube for a considerable length of time. Unfortunately, but few cases are diagnosed at this early stage.

## Œsophageal Perforation.

Perforation of the œsophagus may result from malignant or simple ulceration, or from disease of the mediastinum. It has been known to follow violent paroxysms of vomiting when the œsophagus has undergone previous degeneration. In any event, it is a most serious condition. While œsophagotomy or gastrostomy is indicated theoretically, the results have been so near invariably fatal that the wisest plan probably is to treat the patient on general principles, *i. e.*, symptomatically and rectal alimentation.

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* *Deu. Zeit. f. Chir.*, B. lxxxii, H. 4 to 6.

# CHAPTER VIII.

## DISEASES OF THE STOMACH.

In the treatment of disorders of the stomach, attention to the etiological factors at work in the individual cases plays a part not to be neglected under any circumstances. One must not adhere too strictly to the view that misuse of the stomach is invariably the sole, or, indeed, the most important cause of its disorders, for in a very large percentage of cases—larger, indeed, than most of us would admit at first thought—constitutional factors prove to be of paramount importance. This warning is especially needed at the present time, with the growing disposition to take advantage of surgical measures to correct some local difficulty. How frequently does the physician observe cases in which the most carefully prepared dietetic rules have been followed most religiously, and the medicines administered have been most wisely selected, and yet the results are unsatisfactory. And then the patient takes a vacation from his daily duties, living amidst surroundings by no means as hygienic, so far as his stomach itself is concerned, as those he left, and yet he is able to partake with comfort and pleasure of food ordinarily regarded as indigestible. It will be said, of course, that this remark applies only to the neuroses; true, in some cases, but it also applies to many of the organic dyspepsias as well, *e.g.*, to chronic gastric catarrh.

The general factors productive of gastric disorder are by no means few, and require attention if we would obtain successful results from our treatment. Of these, those relating to the nervous system stand at the head of the list. Meals must be taken amidst pleasant surroundings and with an easy mind. If the patient eats at a time when he is worrying, or with his eyes on the clock having an appointment in view; if with each mouthful he is quietly studying how many hours are added to or substracted from his life by his food, it is pretty certain that he has not obtained from that meal the benefit of which it is capable. On the other hand, let him attend an elaborate banquet with its numerous courses, the cooking not always being by any means of the simplest kind; and yet, because of the hours at the table being hours of pleasure and good fellowship, he is astonished to note how readily all food is digested comfortably. Whatever harm follows is purely mechanical from overloading the stomach.

A common illustration of the influence of mental processes over digestion is found in the gastric discomfort ensuing upon a fit of anger during

or shortly after a meal; or loss of appetite following upon bad temper before meal-times.

Although we cannot do much as physicians to correct the evil, we should, whenever possible, impress upon patients the æsthetics of the dining-table. In the country districts it is not uncommon for meals to be served "on any old thing" that will serve the purpose. Business men at their noon-day "quick lunches," automatic or otherwise, are obliged to put up with conditions that would excite warfare within the home circle. As temporary conditions, *i. e.*, as part of a "picnic," such conditions may entertain, but as a regular thing they must be productive of harm. Even more important is the cleanliness in the serving of food. Half-cleaned dishes, smeary glasses, half-melted butter, soiled napkins, untidy table-cloth and waitresses, must have some effect even on the most hardened "Bohemian."

Just as gastric disturbance follows upon mental perturbation in the healthy, so it is commonly observed in the course of many of the functional nervous diseases, as neurasthenia and hysteria. In these latter cases, most careful examination fails to discover any evidence of actual indigestion. Whatever discomfort which happens to be present consists of mere morbid sensations—paræsthesiæ. In cases of this character, it is the nervous system which requires treatment, not the stomach, which should be practically disregarded. Too often, indeed, the patient makes attempts at self-cure by limiting his diet in one direction or to expanding it in another, but without beneficial result. In some few instances, the neurasthenia and hysteria are secondary to impaired digestion, as in chronic gastric catarrah; but such cases are easily recognized by their histories, and the correction of the primary difficulty proves curative, unless the nervous balance has been too greatly disturbed. Then additional measures must be directed to it after the correction of the local disorder.

Toxæmic states are responsible for numerous dyspepsias. From a practical standpoint, the great majority of the toxæmic dyspepsias are dependent upon the taking of too much food and too little exercise in the open air, with too limited indulgence in pure water. It has pleased the profession under the leadership at first of Murchison, later of Haig, to call such conditions lithæmic. Now there is no objection to such a name if it will lead to better habits as to eating, drinking, and exercise; but to lay all the complaints arising from auto-intoxication to uric acid is in the highest degree irrational and unscientific.

Less frequently observed, though neverthless important, are the toxæmic dyspepsias dependent upon deficient renal action. We are commonly pleased to call such cases "uræmic." It is by no means certain that the urea intoxication is always their cause. Certain it is in cases of chronic Bright's arterio-sclerosis, high blood-pressure, and general malnutrition may vie with toxæmia in producing symptoms.

Syphilis and tuberculosis are two general disorders ofttimes productive of gastric symptoms, even in the absence of local changes in the stomach. Stockton reports a special syphilitic dyspepsia occurring in persons who have been cured (?) of syphilis. The patient complains of some weakness, but no greater than can be accounted for by his dyspepsia. Ordinary remedies and good hygiene accomplish nothing; and yet the antisyphilitic medicines—Mercury and Potassium iodide—effect a prompt cure.

So far as tuberculosis is concerned, we all recognize that deficient appetite and "weak digestion" ofttimes precede by a considerable period the active manifestations of pulmonary mischief. Some might not unreasonably contend that the malnutrition is the predisposing cause of the tuberculosis; but analysis of cases seems to demonstrate that the "weak stomach" is but a pretubercular symptom.

Among the poisons introduced from without the body and capable of disordering the stomach the most important are tobacco, alcohol, tea, and coffee. So frequently are these substances the cause of gastric ill-health, it should be the routine procedure to inquire as to the patient's habits respecting their use in every case. It may be that as regards the use of tobacco and alcohol the patient may give a history of present moderation with past excesses. The moderation under such circumstances counts for but little, for it is of frequent occurrence that the old excesses have awakened an impressionability to these substances that time can never efface. If, therefore, the patient can be brought to a state of total abstinence a cure will be hastened. Alcohol must be regarded as an enemy of the stomach notwithstanding many injunctions to the contrary. Even moderate indulgence, if carried on for years, is capable of exciting a gastric catarrh. As to coffee, moderate indulgence, *i. e.*, once daily, as a rule, is not prejudicial, excepting in some few individuals. Indeed, the morning cup ofttimes promotes regularity of stool, and thereby proves beneficial.

As to goutiness of the stomach, it is to be regarded as an expression of uratic intoxication, and is to be treated on the same general principles as guide us in the management of gout invading other portions of the body.

Reflex irritation is by no means rare as a cause of gastric disturbance. This is not surprising when one considers the numerous points from which such irritation may start. Too commonly we regard the sexual organs in women as the chief of these; too often we overlook such important lesions as floating kidney, naso-pharyngeal catarrh, insufficiencies of the ocular muscles, refractive errors, disorders of the rectum, and pulmonary diseases.

The proper relationship between the dietetic habits of the individual and diseased stomach is, I believe, not well understood. Too often we are inclined to attribute the disease to the regular indulgence in food ordinarily regarded as indigestible. As a matter of fact, bad eating habits

should include overloading of the stomach, the taking of food which has been improperly prepared or cooked, rapid eating, and irregularity in hours of meals. Of course, indulgence in pastry, sweet and highly seasoned food, the products of the frying pan, and foods which are notoriously difficult of digestion are responsible for many cases, but these are less frequently observed than is ordinarily believed.

The majority of persons who eat extravagantly are possessed of sound stomachs in the beginning ; indeed, it may be said that they are blessed with unusually good stomachs, for otherwise they would not enjoy eating. It generally requires years of overindulgence to make the bad influence of intemperate eating evident.

Imperfect mastication is probably the most frequent cause of gastric disorder among the American people. The causes leading to it are "the habit of being in a hurry," and defective teeth. The baneful influence of rapid eating is made still more pernicious by the free drinking of water at meals to wash down imperfectly salivated and masticated food.

The damage done by rapid eating is quite varied. It introduces into the stomach pieces of food of sizes larger than that organ should receive, or can expect to manage properly. Necessarily, then, the gastric mucous membrane is exposed to mechanical and even chemical irritation (if food is retained and decomposes). Portions of food enter the duodenum imperfectly prepared for the intestinal juices, and here again they become the source of additional irritation. Lastly, rapid eating leads to the introduction of food at an improper temperature into the stomach. One minute the patient is swallowing a cold food ; the next, something unduly hot. Such extremes must exert a deleterious influence. They are bad enough alone ; but when alternating, they are disease producing.

Slow eating, though generally regarded as praiseworthy, may be carried to the verge of being a vice. I have one patient and friend of this character. He takes particular pains to masticate every particle of food over and over again. In conversation he dilates upon his most excellent eating habits, and discusses the value of this or that nutriment. His family is like unto himself. Is it any wonder that they are a bunch of illy-nourished hypochondriacs ? I doubt if any of them ever takes sufficient to satisfy the demands of nutrition.

The bad influence of improper cooking is not fully realized by the profession and laity. After partaking of meals at a number of houses, I must confess my surprise at the large number of people who have not the slightest idea of the simple rudiments of cooking, The quantity of bad bread palmed off as "the staff of life" alone is appalling.

Exercise in the open air is undoubtedly an important aid to digestion in the healthy. Hence it is that persons who lead sedentary lives are not infrequently dyspeptic. But this does not furnish good and sufficient reason

for ordering active exercise for all victims of gastric disease. Much will depend upon the nature of the pathological condition from which the patient is suffering. Some lesions, as acute gastritis and gastric ulcer, demand absolute general and local rest.

Physiological experiments on the healthy have demonstrated that gastric acidity is increased by rest after a meal; that physical exercise increases the motor power of the stomach; that the influence of sleep on secretion and motor activity is not decisive. We cannot, however, make use of these facts for routine advice to patients with gastric disorder. We must consider the patient and his disease, and individualize most carefully.

We can say certainly that violent physical exercise after eating is almost invariably bad. That patients who are much under weight are better suited to rest than exercise is likewise certain. In the majority of cases rest in a horizontal position for a time at least after eating is advisable. In no instance is it advisable, and in but few permissible, that the patient take to exercise immediately after eating. Patients with gastric atony should always rest in a recumbent posture, as thus considerable strain is taken from the walls of the stomach.

As a rule, it is sufficient to advise the continuance of the rest for one hour only after eating. At other times, exercise judiciously selected according to the strength and nutrition of the patient and the nature of his illness should be the rule.

In gastric ulcer and bad cases of neurasthenia absolute and prolonged rest in bed is essential.

**Principles of Dietetics in the Treatment of Disorders of the Stomach.**—Notwithstanding the importance of dietetic precaution in the management of diseases of the stomach, the restrictions not infrequently placed upon patients suffering from this class of ailments are ridiculous, if not absolutely harmful. The practice of dietetics must be placed upon a rational basis. We must first consider the condition of our patient, and the nature of the complaint for which he demands relief. Then we must consider the indications to be fulfilled in the management of the case. In every case, aside from those to be mentioned shortly, food must be prescribed sufficient to nourish the patient. Sometimes we are unable to do this, because waste is in excess of repair, and must remain so because of the pathological conditions at work. Then we must rest satisfied with maintaining as high a standard of nutrition as is possible under existing circumstances.

The other indication in the prescribing of diet is "rest." Unfortunately, it is too commonly the practice on the part of both profession and laity to pay attention to this indication only. Of course, there are cases in which rest for the stomach is the important if not the sole indication in the administration of food. We find good examples of this in the acute

gastric disorders and in gastric ulcer. To pay too much attention to gastric rest by routine prescribing of partially or completely predigested food, or foods which throw but little work on the stomach, tends to weaken that organ and increase any diseased process which may be present. Healthy function of most organs demands a proper amount of normal exercise, and the stomach is no exception to this general rule.

In the healthy but little attention should be paid to the question of diet, so long as the viands furnished are tasteful, and, in a general way, are properly distributed as proteids, starches, and fats. The natural tendency on the part of sensible, shall we say, providers or caterers, gives a good average variety. When, however, the healthy individual begins to study the food he shall take according to its digestibility his troubles begin. Aside from the mental influence—which is necessarily bad—he limits the variety, and he accustoms his stomach to foods which require but little work for their digestion. That organ is no different from any other. It requires work to develop its functions. A certain proportion of "heavy" food is a good thing for it.

Of late years, there has sprung up a business which has enriched the pockets of manufacturers and impoverished the digestive powers of many of the best men of the land. Is it necessary to say that I refer to the breakfast foods? Yet that is just what I mean. These various substances have been manufactured and advertised without number. Their wonderful (?) nutritive virtues, especially their brain- and muscle-producing qualities extolled, and yet what are they? TRASH OF THE WORST KIND.* They are utilized in the morning for filling up the stomach with nothing, leaving but little space for the really nutritious foods, as beefsteak, chops, eggs, etc. About their only value lies in the fact that the patient—victim is a better word—is instructed to take plenty of cream with them.

**Diet in Acute Gastric Disorders.**—The great principle in the treatment of acute gastric disorders is local and general rest. If the pathological changes are severe, rest in bed must be enjoined, and little or no food introduced into the stomach. In the case of the ordinarily severe acute gastric disturbances the patient may go about. As a rule, the feelings of the patient are a fairly good guide as to the proper course to pursue. If his illness is of such a character as to demand his confinement to bed, it is the rule for him to feel sufficiently ill to lead him to do this without seeking the advice of his physician.

Inasmuch as acute indigestions continue for but a few days, the patient can well afford to starve or go on scanty diet for that period of time, Nourishment as such is not, therefore, important. Of course, cases must be individualized and diet prescribed accordingly. When the stomach is

* Newspaper statements are authority for the rumors that food commissioners have suppressed some of these articles because they consisted of ground corn-cobs and like indigestible materials.

unduly irritable, rejecting all food, nothing but the simplest articles should be permitted. It may even be wise to limit the patient to cracked ice, rice-water, milk and lime water, gruels, and broths. Fortunately, the patient will not protest against this starvation diet, for loss of appetite is a prominent feature in such cases. No effort should be made to overcome this symptom in acute cases, for it is a conservative one. As the patient improves, various articles may be added to those above mentioned, including bread, toast, soft-boiled eggs, broiled chicken, chops, and baked potatoes.

**Diet in Chronic Gastric Diseases.**—Owing to the long duration of chronic gastric disorders, digestive rest is inadmissible, for the patient's nutrition is tolerably sure to suffer thereby. Much of the emaciation observed in this class of diseases is dependent not upon the pathological changes, but upon the enforced starvation. Again, it is not always wise to relieve the stomach of too much work for functional activity is thereby reduced, and this in turn leads to local weakness. This remark must not be interpreted to mean that food should be crowded on the chronic dyspeptic, and that he must eat anything and everything; but rather that sufficient food must be administered to maintain weight, and this food must be well selected. The idiosyncrasies of the individual and the directions in which gastric functions are impaired must also be considered. When dealing with the patient's so-called idiosyncrasies the greatest display of judgment is demanded, for too often they are the product of an abnormally active imagination or auto-suggestion.

It must be borne in mind that the principles underlying the selection of a diet are based entirely upon the indications afforded by the disturbances in function and the pathological changes. These will receive special attention in the pages devoted to the treatment of the various diseases of the stomach. In chronic gastric catarrh and the functional dyspepsias, the principal object in formulating a diet is to maintain the patient's nutrition. It is a good rule of practice to weigh the patient regularly; and as long as he maintains or increases his weight the food may be accepted as sufficient for purposes of nutrition. In a general way it may be said that very few plain articles of food really disagree. If the case has continued for a long time prior to coming under treatment, the patient himself will probably remark that he has followed numerous dietetic rules, but that he cannot see that he has derived any particular advantage from any one of them. As a rule, it is found that he has restricted himself to such an extent that he is in a state of semi-starvation. In such cases, it is not good practice to order all at once the full diet of which the patient is believed to be capable. It is better by far to start with a liquid diet—*i. e.*, milk and broths—gradually adding thereto until at the end of a few weeks sufficient food is administered to satisfy all the demands of the body. Special systems of diet should find little favor for prolonged use. Patients may thrive for a time on single

articles, as the raw beef of the Salisbury treatment, and, exceptionally, some are able to continue it until recovery is effected. As a rule, however, more or less variety must be permitted. Any dietetic instructions which do not include bread and butter must be regarded as especially defective. We might speak even more positively and say that these articles are indispensable.

Before giving advice as to the character of food to be taken, it is a wise plan to learn exactly what have been the habits of the patients as to the past. To do this, the patient should be instructed to prepare a complete list of all the food taken over a period of a week, mentioning therein the approximate quantities of each. This gives us a starting-point and, at the same time, acquaints us with the dietetic habits of the patient in a way not to be equalled by any other plan.

As to the use of the digestive ferments, there really seems to be but a limited field for them, administered in their pure state internally. Malt, as ordinarily given for its action on starch, is certainly useless. This agent exerts its diastasic action on starch only in the presence of an alkaline or very feebly acid reaction. The ordinary acidity of the stomach after the ingestion of a full meal is sufficient not only to prevent its diastasic action, but to destroy it permanently. The inutility of administering malt in given doses immediately after meals is thus made apparent. But recently, the agent for a house manufacturing a very good malt extract exhibited a prescription for the use of his commodity that for pharmaceutical imcompatibility certainly deserved a prize. The mixture consisted of malt, sherry wine, dilute muriatic acid, and pepsin. Here was an agent capable of acting only in the presence of an alkali, whose action indeed was permanently destroyed by a certain amount of acidity, combined with another (pepsin) which acts in the presence of an acid reaction. Yet because that prescription is peddled about from office to office, it will be utilized by the many who will not think for themselves. This, of course, does not detract from the value of malt, for there is a right way of using it. As already intimated, I have used the thick, treacle-like preparations, as maltine and Trommer's malt, spread on bread, with advantage, giving the patient directions to see that the food is thoroughly chewed. Roberts, in his little book on *Digestion and Diet*, recommends also an infusion of malt, which, he says, has diastasic properties fully equal to the best malt extracts. This infusion is prepared as follows: Three heaping tablespoonfuls of crushed malt are mixed with a half pint of cold water, and allowed to stand over night. In the morning this is filtered. It is used either by taking with a meal or by adding to gruels, etc. In the latter case, the gruel is first prepared, and when sufficiently cool to be tolerated by the tongue, the infusion of malt is added. One tablespoonful of the infusion is sufficient to digest one-half pint of gruel. In a very few minutes the gruel becomes thin from the conver-

sion of the starch. In some cases the use of the dry malts may prove convenient. These, as well as the malt infusion recommended by Roberts, I have never used. It should be remembered that the latter spoils very easily, and should be made fresh each day.

Pepsin is the only digestive ferment that can be given by the mouth, and permitted to act under normal conditions.

It is used very largely by physicians as one of the constituents of prescriptions for indigestions of various kinds. At one time it was used indiscriminately, and, by the old school, for almost every case. For some years past, however, its use has been discarded very largely, because it has been demonstrated that in laboratory experiments the doses administered fell far short of the quantities necessary to digest the food consumed. And yet for years physicians and patients alike thought they observed good results from its use! Personally, I believe that Pepsin is a useful remedy, though its activity for good is much less than that with which it was formerly credited. Experience leads me to believe that small doses of Pepsin are of value. Thus, I have in my office tablets of Nux vomica 1x and Carbo veg. 1x, each combined with the first decimal of Pepsin. My use of these is empirical, of course. I am obliged to admit that in atonic dyspepsias they appear to be of greater efficacy than the medicinal element of the tablet taken uncombined.

Once praised without qualification, then abused without stint, has been the history of Pepsin. The laboratory cannot be regarded as the equivalent of the humany economy. Experience teaches that Pepsin is of some value, and yet it cannot be so because it takes the place of gastric secretion. There appears to be very good reason for assuming that it acts as a stimulant to the gastric glands in cases of atonic dyspepsia. It should always be given in combination with an acid; never with an alkali.

Pancreatin is of great value in the preparation of predigested foods. Care must be exercised, however, in employing it in this manner, because the exhibition of nutriment in this form, if persisted in for too long a time, weakens the digestive functions. Predigested foods must be regarded as a temporary expedient for the purpose of carrying the patient over a period of weak digestion and malnutrition.

Hence, it has been asserted that it is useless to give it medicinally, because it must pass through the stomach with the acid contents of that organ. It is well known, however, that the acidity of the gastric contents does not become manifest until 15 minutes after the ingestion of food. If, therefore, Pancreatin is given with the meal, it exerts quite a material action before the gastric secretions can put a stop to its digesting function.

In all cases of gastric disease characterized by absence of hydrochloric acid from the gastric contents its action continues throughout the digestive

process. In such it becomes a great relief to the intestines. It is especially adapted to cases in which the ability to digest starches and fats is impaired.

The objection made to digestive ferments that their use suspends the performance of a normal function is not valid. They give the stomach the rest it requires, and their use is not persisted in for a length of time likely to prove injurious. It is, of course, otherwise with their indiscriminate use by the laity on any and all occasions.

A remedy, the value of which is very much underestimated, is inspissated ox-gall (*Fel bovis purificatum*). It is indicated in those cases of indigestion which appear to result from deficient secretion of bile, and are characterized by difficult digestion of fatty substances. As ordinarily used, however, it is absurd to expect any therapeutic results from this remedy, for it is not infrequently combined with pepsin, pancreatin, etc., and coated with sugar or other substances which dissolve in the stomach. Under such circumstances the bile is set free in the stomach, and thereby interferes with gastric digestion, because it prevents the gastric juice from acting upon proteids and albuminous substances. It should, therefore, be coated with keratin or some other substances which cannot dissolve until it reaches the alkaline secretions of the intestines. It must be given one hour after meals, and in doses of from 5 to 15 grains. It exerts antiseptic and slightly laxative properties. It is very useful in habitual constipation with malassimilation. It also posesses considerable value in some cases of jaundice. There is good reason for believing that it stimulates the flow of bile.

Dietetic directions are best given to patients in writing. I must warn readers against the too prevalent practice of using the many diet lists sent out by various pharmaceutical houses in advertising their wares. True it is they are excellent in their way, and show careful preparation. But their use savors of routinism. It makes the physician dependent upon drug-houses for brains instead of developing his own. Moreover, patients are not fools, and soon discover the source of these diet slips, especially after visiting two or three physicians and obtaining the stereotyped dietetic directions from each. My practice is to make use of what might be called a "blanket sheet" containing a full list of articles of diet in ordinary and sick-room use. It is a very simple matter to go over one of these carefully erasing such articles as one wishes to forbid, and indicating those which must be taken in moderation. When it is desirable to specify more particularly the food to be taken at each meal and the quantities thereof, it will of course be necessary to prepare written instructions.

In all cases of stomach disease, it is of the highest importance that the motor power of the organ be thoroughly understood. Its digestive capacity is of secondary importance, for we meet with numerous instances in which the secretory function of the stomach is *nil*, and yet because the motor function is unimpaired the intestines are able to act vicariously, and

so compensate for gastric insufficiency that the patient experiences little or no distress. This statement is not intended to underestimate the importance of gastric digestion; for we must all admit its value. We know that the intestines are not always able to compensate fully for its deficit. We must make ourselves acquainted with the composition of the gastric contents after a test meal, as such information will guide us in suggesting a diet.

Undoubtedly, the physical condition of food-stuffs must be considered as having a bearing on the treatment of digestive disturbances in view of the fact that the impairment of the motor function of the stomach is an important matter in nutrition. As in selecting food according to its digestibility, we should not go too far, lest we exercise the stomach muscle too little. Einhorn * has classified foods according to physical conditions as follows:

1. *Food in Liquid Form.*—(*a*) Liquid at ordinary temperature—milk, meat juice, beef tea, bouillon, peptone or sarcopeptone dissolved in water, bread water, strained barley, oatmeal, rice water, strained oyster soup, egg-albumen water; (*b*) liquid at the body temperature—jellies, fruit jelly, calves' foot jelly, ice cream, water ice.

2. *Pulpy Form.*—The food is mechanically converted into very minute particles and well mixed in liquids—pap soups (barley, oatmeal, farina, rice, sago); egg in bouillon; Leube's meat solution, pulverized meat, pulverized crackers in milk, water, or bouillon; buttermilk, koumyss, cream, butter.

3. *Food which by Slight Trituration in Fluids Separates into Minute Particles.*—White bread in milk or water; the tips of well-boiled asparagus; carrots, mashed potatoes, baked potatoes; the yolk of hard-boiled eggs; oysters (raw).

4. *Solid Food.*—White bread, rye bread, meat, hard-boiled eggs, fish, cheese.

5. *Substances not Easily Digested.*—Meat with tough fibre; lobster; sausages and Swiss cheese on account of their solidity; all substances containing much cellulose, principally when eaten raw; cold slaw; all salads, cucumbers, pickles, raw fruit, apples, pears, pineapples; fruit which contains much acid, therefore all unripe fruit, strawberries; substances containing much sulphur and forming gases in the intestines; all kinds of cabbage, principally white cabbage; beans.

Food-stuffs must be studied as to their digestibility and as to their nutritive value.

Our knowledge as to the digestibility of food-stuffs is based very largely upon the experiments of Leube and Penzoldt. Leube's experiments were performed on stomachs impaired by disease by determining

* *Diseases of the Stomach*, 4th revised edition, p. 145.

how long would be required to digest the various substances investigated. He assumed that if a healthy stomach could get rid of a moderate amount of food in six to seven hours that that food was readily digestible. Conversely, if it was not so disposed of in that time it was not so digestible. In this way Leube constructed the following scale of foods according to their digestibility.

"**Diet I.**—If the digestion is very much impaired, the following articles of food are most easily digestible: Bouillon, meat solutions, milk, raw or soft-boiled or poached eggs.

"**Diet II.**—Less digestible than Diet I are the following articles of food: Boiled calves' brain, boiled thymus, boiled chicken, and pigeon. These different kinds of meats are enumerated in the order of their digestibility. Other articles of food that are permissible are gruels, and in the evening, milk mushes made with tapioca and white of egg. The majority of patients can assimilate boiled calves' feet in addition to the articles of meat mentioned.

"**Diet III.**—If Diet II can be digested, Diet III follows: The increase consists in adding cooked or raw beef to the above diet list. Leube mentions the following method of preparing beefsteak, and claims the beef cooked in this way is very easily digestible. The meat should be allowed to lie for some time and scraped with a dull spoon; in this way a meat pulp is obtained, consisting only of the delicate parts of the muscle, and containing none of the tough, hard, and sinewy portions. These meat-scrapings are roasted in fresh butter. Raw ham is also permissible in this stage.

"In addition to meat a little mashed potatoes may be given, some white bread that is not too fresh, and possibly small quantities of coffee or tea with milk.

"**Diet IV.**—Roast chicken, roast pigeon, venison, partridge, roast beef, medium to raw (particularly cold), veal (from the leg), pickerel, boiled shad (trout, even young ones, are hard to digest), maccaroni, bouillon with rice. Small quantities of wine to be taken one to two hours before eating; gravies are contra-indicated. Young and finely-chopped spinach is the best vegetable; other vegetables, as asparagus, may be tried, although Leube regards this as a risky procedure. The patients are allowed to take a more liberal diet after this fourth diet, but the increase should be very gradual. They should refrain from eating vegetables, salads, and preserves and fruits for a long time. The first of these articles they may eat is baked apple."*

Penzoldt, working along the same lines as Leube, but experimenting upon healthy stomachs, constructed the following table of the digestibility of food-stuffs:

* Quoted from Riegel's *Diseases of the Stomach*, Nothnagel's *Encyclopædia*, p. 180 and 181.

The following articles left the stomach within—

One to two hours :

100–200 grm. pure water.
220 grm. carbonated water.
200 grm. tea alone.
200 grm. coffee alone.
200 grm. cocoa alone.
200 grm. beer.
200 grm. light wine.
100–200 boiled milk (A, 3.5 ; F, 3.5 ; C, 5).
200 grm. meat-broth alone.
100 grm. eggs, soft.

Two to three hours :

200 grm. coffee with cream.
200 grm. cocoa with milk.
200 grm. Malaga wine.
200 grm. " Ofen " wine.
300–500 grm. water.
300–500 grm. beer.
300–500 grm. boiled milk.
100 grm. eggs, raw, scrambled, hard boiled, or as omelet (A, 12 ; F, 12).
100 grm. beef sausage, raw.
250 grms. calves' brains, boiled.
250 grms. calves' thymus boiled.
72 grms. oysters, raw.
200 grm. carp, boiled.
200 grm. pike, boiled (A, 18 ; F, 0.5).
200 grm. shellfish, boiled (A, 17 ; F, 0.05).
200 grm. boiled (A, 80 ; F, 1).
150 grm. cauliflower, boiled (A, 2 ; C, 4).
150 grm. cauliflower as a salad.
150 grm. asparagus, boiled (A, 2 ; C, 2).
150 grm. potatoes boiled in salt water (A, 2 ; C, 20).
150 grm. mashed potatoes.
150 grms. stewed cherries.
150 grms. raw cherries.
70 grm. white bread, old or fresh, dry or with tea (A, 7 ; C, 32).
70 grm. pretzels.
70 grms. zweibach, fresh or stale ; dry or with tea.
50 grm. Albert biscuits.

Three to four hours :

230 grm. young chicken, boiled (A, 20 ; F, 4).
230 grm. partridge, boiled.

220–260 grm. pigeon, boiled.
195 grm. pigeon, fried.
250 grm. beef, raw, boiled, lean (A, 21 ; F, 1.5).
250 grm. calves' feet, boiled.
160 grm. ham, boiled (A, 24 ; F, 36).
160 grm. ham, raw.
100 grm. veal, warm, and cold, lean (A, 20 ; F, 1.5).
100 grm. beefsteak, broiled, cold or warm.
100 grm. beefsteak, raw, scraped.
100 grm. tenderloin.
200 grm. Rhine salmon, boiled (A, 16 ; F, 28).
72 grm. caviare, salted (A, 1 ; F, 16).
200 grm. sardines in vinegar, kippered herring.
150 grm. blackbread (A, 6 ; F, 0.5 ; C, 50).
150 grm. barley bread.
150 grm. wheat bread.
100–150 grm. Albert biscuits.
150 grm. potatoes as a vegetable.
150 grm. rice, boiled (A, 3 ; C, 76).
150 grm. kohlrabi, boiled (A, 3 ; C, 8).
150 grm. carrots, boiled (A, 1 ; C, 9).
156 grm. spinach, boiled.
150 grm. cucumber salad.
150 grm. radishes, raw.
150 grm. apples.

Four to five hours :

210 grm. pigeon, boiled.
250 grm. fillet of beef, broiled.
250 grm. beefsteak, broiled.
250 grm. beef tongue, smoked (A, 24 ; F, 31).
100 grm. smoked beef in slices (A, 27 ; F, 15).
250 grm. hare, broiled.
240 grm. partridge, broiled.
250 grm. goose, broiled (A, 16).
280 grm. duck, broiled.
200 grm. herring, salted.
150 grm. lentils, mashed (puree) (A, 25 ; C, 54).
200 grm. peas as puree.
150 grm. string beans, boiled (A, 3 ; C, 6).

With the above as a foundation, Penzoldt has constructed four diet lists to be used either for the purpose of resting a diseased stomach, or for educating an impaired organ to greater functional activity.

## DIET I.—(*About Ten Days*).

| Food or Drink. | Largest Quantity to be Taken at a Time. | Method of Preparation. | Special Requiremeuts. | How to be Eaten. |
|---|---|---|---|---|
| Meat-broth | 250 grm. (¼ litre.) | From beef | Without fat or not salted. | Slowly. |
| Cow's milk | 250 grm. (¼ litre.) | Well boiled or sterilized. | Entire milk, or ⅓ lime water ⅔ milk. | If desired, with a little tea. |
| Eggs | 1 or 2 | Very soft, just heated or raw. | Fresh | If taken raw, should be stirred into the warm, not boiling, meat-broth. |
| Meat solution (Leube-Rosenthal.) | 30–40 grms. | | Should have only a slight meat-broth odor. | In teaspoonful doses, stirred in meat-broth. |
| Cakes (Albert biscuits). | 6 | | Without sugar | Not softened, but should be thoroughly masticated and insalivated. |
| Water | ⅛ litre | | Ordinary water or natural carbonated water, with a small percentage of carbonic acid gas. (Seltzer.) | Not too cold. |

## DIET II.—(*About Ten Days*).

| Food or Drink. | Largest Quantity to be Taken at a Time. | Method of Preparation. | Special Requirements. | How to be Eaten. |
|---|---|---|---|---|
| Calves' brain | 100 grm | Boiled | Freed from all membranes. | Best taken in meat-broth. |
| Thymus from calf. | 100 grm | Boiled | As above, should be carefully enucleated from its capsule. | Best taken in meat-broth. |
| Pigeons | 1 | Boiled | Only if young, without skin, tendons and the like. | Best taken in meat-broth. |
| Chicken | 1 as large as a pigeon. | Boiled | As above (no fattened chicken). | Best taken in meat-broth. |
| Raw beef | 100 grm | Chopped fine or scraped, with a little salt. | From the tenderloin. | To be eaten together with cakes. |
| Raw beef sausage | 100 grm | Without any additions. | Smoked a little. | To be eaten together with cakes. |
| Tapioca | 30 grm | Boiled with milk to make gruel. | | |

## Diet III.—(*About Eight Days*).

| Food or Drink. | Largest Quantity to be Taken at a Time. | Method of Preparation. | Special Requirements. | How to be Eaten. |
|---|---|---|---|---|
| Pigeon | 1 | Broiled with fresh butter. | Only young birds, skin, etc. | Without gravy. |
| Chicken | 1 | Broiled with fresh butter. | Only young birds, skin, etc. | Without gravy. |
| Beefsteak | 100 grm. | With fresh butter, half-rare (English.) | From the tenderloin, well beaten. | Without gravy. |
| Ham | 100 grm. | Raw, scraped fine. | Smoked a little (without the bone). | With white bread. |
| Milk bread, or Zweibach or Freiberger pretzels. | 50 grm. | Crisp, baked. | Stale (so-called rolls, etc). | To be carefully masticated and well insalivated. |
| Potatoes | 50 grm. | (*a*) Mashed. (*b*) Boiled in salt water and mashed | The potatoes should be mealy and crumble on crushing. | |
| Cauliflower | 50 grm. | As a vegetable, boiled in salt water. | Use only the "flowers." | |

## Diet IV.—(*About Eight to Fourteen Days*).

| Food or Drink. | Largest Quantity to be taken at a Time. | Method of Preparation. | Special Requirements. | How to be Eaten. |
|---|---|---|---|---|
| Venison | 100 grm. | Roasted. | From the back; should hang for a time but not be "high." | |
| Partridge | 1 | Roasted, without bacon. | Young birds without skin, tendon, legs, etc.; should hang for a time. | |
| Roast beef | 100 grm. | Medium to rare. | From good fatted cattle; beaten. | Warm or cold. |
| Fillet of beef | 100 grm. | Medium to rare. | From good fatted cattle; beaten. | Warm or cold. |
| Veal | 100 grm. | Roasted. | Back or leg. | Warm or cold. |
| Pike, Shad, Carp, Trout. | 100 grm. | Boiled in salt water without any additions. | All fish bones should be carefully removed. | In the fish gravy. |
| Caviare | 50 grm. | Raw. | Slightly salt; Russian. | |
| Rice | 50 grm. | Mashed; pressed through a sieve. | Soft boiled rice. | |
| Asparagus | 50 grm | Boiled. | Soft, without any of the hard parts. | With a little melted butter. |
| Scrambled eggs | 2 | With a little fresh butter and salt. | | |
| Omelet (souffle) | 2 eggs | With about 20 grm. sugar. | Must have risen well. | To be eaten at once. |
| Fruit sauce | 50 grm. | From fresh boiled fruit, to be strained. | Free from all kernels and peel. | |
| Red wine | 100 grm. | Light, pure Bordeaux. | Or some corresponding kind of wine. | Slightly warmed. |

The above then gives a fair idea of the character of food to be taken when the stomach is on short allowance and requires education. The examination of the stomach and its functions may show the necessity for variations from this plan. In cases of hyperchlorhydria, it is often advisable to give food which has the power of combining with a maximum quantity of hydrochloric acid.

**The Quantity of Food Required.**—Food serves the double purpose of maintaining nutrition or repairing tissue waste and of generating heat. The latter is its most important function. The value of food to the economy is determined by its ability to generate heat; hence, we use as the unit of value the "calorie" or heat unit. A heat unit is that quantity of heat which is required to raise the temperature of one gramme of water 1° C. A "great heat unit" is the amount of heat required to raise the temperature of 1,000 grammes of water 1° C. It is the great heat unit to which we refer in speaking of food values. In a general way, the caloric value of food depends upon the number of atoms of carbon it contains.

The average man requires foods having a heat value of 2,720 calories per day. This should consist of albumen, fat, and carbohydrates. It is not necessary to adhere to a fixed proportion of each. Von Voit once stated that the daily quantity of food for an adult of average weight should be 100 grammes of albumen, 50 grammes of fat, and 450 grammes of carbohydrates. To obtain the caloric value of any food-stuff, the number of grammes of albumen contained in it should be multiplied by 4.1; the number of grammes of fat by 9.1; and the number of grammes of carbohydrate by 4.1. As already stated, it is not necessary that the proportions proposed by von Voit be maintained, for it makes no difference so far as the nutritive value of the food taken is concerned whether the requisite number of calories be supplied by fat, albumen or carbohydrate.

Persons who are in bed require one-seventh less calories than do those who are up and about.

Fats have a nutritive value far greater than that of any other class of foods. This gives us an invaluable hint for the improvement of the nutrition of our patients. There is a current opinion among the laity that fats are difficult of digestion, and are therefore let strictly alone. It has not been many years indeed since the medical profession shared in this belief, and in giving orders to dyspeptics and others gave instructions that fats should not enter into the diet list excepting in a limited amount. Of course, there are fats which are difficult of digestion. Some are made so by processes of cooking, as by frying. We have, however, a number of fatty foods which even a delicate stomach can tolerate. High on this list stands butter, which has a value of 3,600 calories per pound. It can be used in conjunction with other easily digested foods, as bread. By judicious training in butter eating, we can do more than in any other way in maintaining the patient's general nutrition.

Within the past few years, olive oil has become a dietetic fad. As a food it has great merit, its caloric value being variously stated as from 3,600 to 4,000 calories to the pound. It is open to the objection of being overdone, people taking it in quantities sufficient to disturb digestion, or at least to tax the digestive powers.

**Local Treatment of the Stomach.**—The stomach may be treated locally by means of lavage, the spray, electricity, massage, and surgical procedures.

(*a*) **Lavage.**—Lavage or washing out of the stomach is accomplished by means of a soft-rubber tube introduced into the stomach. The intragastric end of the tube should be open and its edges properly rounded. At about one-half inch from the extremity there should be a lateral opening, which also must be carefully rounded. A very serious defect of some stomach tubes is found in the manner of making the side opening. This has been performed in such a way as to deprive the tube at this point of any body or resistance. The natural result of this mistake becomes obvious on attempting to insert the tube, for as soon as it encounters the resistance of the pharynx the end knuckles on the body of the tube and introduction becomes impossible. Manufacturers and purchasers should look out for this defect, for it is not an uncommon one. As sold in the shops, the outer end of the stomach tube is provided with a soft-rubber funnel. This is hardly to be considered an advantage, for the capacities of these funnels is too small, and their softness at times makes them awkward to handle. It is much better to remove the soft-rubber funnel and attach in its place one made of glass, and capable of holding at least one pint.

The first introduction of the tube in any given case is not always an easy matter, owing to the irritability of the fauces and stomach. The former may be obviated in a measure in several ways. The patient may prepare himself for the procedure by manipulating his pharynx and fauces with his fingers or the handle of his tooth-brush, thus accommodating it to the presence of a foreign body; the reflex irritability of the pharynx may be lessened by the administration of bromide of potassium in doses of ten grains three times daily for three or four days; or the pharynx may be painted immediately before the introduction of the tube with a 4 per cent. cocaine solution. The potassium bromide reduces the gastric irritability in a measure. But, as a rule, the only thing that serves to overcome this interference with lavage is time. In but few cases does the stomach resent the presence of the tube after four or five seances.

To introduce the tube, the patient is instructed to throw his head *slightly* backwards and protrude his tongue. The tube, lubricated with water or milk (oil should never be used), is next passed over the dorsum of the tongue until it engages in the pharynx. The patient then closes his

lips about the tube and is instructed to swallow. At the same time the operator pushes the instrument onwards, encouraging the act of deglutition as he does so. When the edges of the teeth are on the black ring marked on most tubes, it is known that the instrument has been introduced sufficiently. With some few patients, the tube can be introduced only when the chin is slightly flexed on the chest.

We are now ready for the introduction of the material with which the stomach is to be washed. Ordinarily, plain warm water is all-sufficient. When, however, the stomach contains much mucus, the removal of the latter may be facilitated by the addition of the granular effervescent Vichy salt. When pouring the water into the funnel, the latter should be held on a level somewhat higher than the head of the patient and grasped in the operator's hand so that the little finger comes into contact with the tube in such a way that the flow can be stopped at once by pressure of the tube between the tip of that finger and the hypothenar eminence. The quantity of water introduced into the stomach at any one time should never be more than a pint at first, and later it should never exceed a quart. When the desired quantity has passed into the stomach, the flow should be checked as above indicated, some water being permitted to remain in the funnel. The latter is now lowered to a level below that of the stomach and over a waste receptacle, the pressure of the little finger is released, and immediately the water in the stomach begins to flow out by siphonage. This process is repeated until the return flow of water is absolutely clear. Any lavage which is not carried out until the latter end is secured fails to accomplish all the good to be obtained from the measure. *To be efficient, the operation must be thorough.*

The frequency with which lavage should be performed will depend very largely upon the case. As a rule, it is required at first on alternate days. In some instances, the best results are not accomplished without daily sittings. The judgment of the physician must decide.

It is not unusual for the introduction of the water into the stomach to be followed by its violent ejection around the tube. This is no contra-indication for proceeding further. It is simply an inconvenience. The return flow is simply by way of the natural passage instead of through the tube by siphonage. A few treatments overcome the difficulty.

After completing the lavage, it is important always to introduce through the tube some easily digested nutriment. The most satisfactory is a pint of peptonized milk or an equal quantity of malted milk. This should be done despite the persistence of the vomiting throughout the washing process. Many times have I seen the gastric irritability cease with the tube still in position as soon as the peptonized milk reached the stomach.

Special apparatus, as the double current tube, have been recommended

for the practice of lavage. But I believe that the simple soft-rubber tube accomplished every purpose. The Leube–Rosenthal apparatus for gastric lavage is undoubtedly more convenient than the ordinary stomach tube, and will prove a great saving of wear and tear of a physician who has much gastric work in his office practice. This, and the fact that the washings of the stomach never find their way into the intake tube are its main advantages. The general practitioner will find it better for himself, however, if he foregoes the luxury of this apparatus and limits himself to the ordinary tube.

Some practitioners—they are very few—do not seem to be able to acquire the knack of withdrawing gastric contents by expression, or of starting siphonage during lavage. For them, the Friedleib tube is a convenience. This instrument is provided with a rubber bulb by means of which the exit of gastric contents may be started. Personally, I do not care for this tube, as it is conceivable that the suction force of the tube may damage the gastric mucous lining.

The only difficulty ordinarily encountered in washing out the stomach is the obstruction of the tube by the entrance of solid particles of food. These may be dislodged by the application of the Benedict roller forceps, or by pouring in additional water under the pressure of a high elevation of the funnel.

When withdrawing the tube, it is absolutely essential that its lumen be closed completely by pressure between the fingers to prevent the escape of any fluid which it may contain into the larynx.

**Indications for the Use of Lavage.**—The great relief resulting from the proper use of lavage has led to its employment in many conditions to which it is not adapted and in many others in which it is positively contra-indicated. Lavage clears the stomach of its contents. It is indicated, therefore, in all conditions characterized by prolonged retention of food, stagnation and fermentation of gastric contents, and the presence of undue quantities of mucus. It is to be used, therefore, in dilatation, pyloric stenosis, whether malignant or benign, chronic gastric catarrh, and gastric hypersecretion. It is useless in all other conditions. As a matter of experience, lavage may be employed also in cases of persistent vomiting and hiccough, but only when the associated symptoms demonstrate that lesions which contra-indicate the use of the tube are absent. The results in many of these cases are of the most brilliant order. In the gastric neuroses, lavage may do some good by reason of relieving an associated catarrh or by exerting an influence on the mind of the patient. It is positively contra-indicated in all cases in which there has been recent vomiting of blood, when there is a strong suspicion as to the integrity of the heart muscle; in patients who have had an apoplectic seizure; in cases of advanced tuberculosis, and in all acute gastric and intestinal diseases attended by fever.

The time of day selected for the seances should, as far as possible, be that when the stomach is the freest from food. This injunction is not of much importance excepting in cases of chronic gastric catarrh.

**The Gastric Douche.**—This is a modification of lavage. The tube used has a number of openings but little larger than pinholes at its gastric terminus, through which the water is forced under high pressure by raising the funnel to the fullest extent permitted by the length of the tube. The forcible impact of the jets of water against the walls of the stomach may be highly beneficial in some cases; *e.g.*, in cases of gastric neurosis and atonic dyspepsia. An objectionable feature of the gastric douche is the difficulty with which the return flow of water by siphonage is accomplished.

To overcome this objection to the gastric douche, Einhorn * has constructed an apparatus based upon a valve arrangement. "The apparatus consists of a rubber tube, not too flexible (thickness, three-eighths of an inch; length, twenty-six inches), at the end of which a hard-rubber capsule is attached. Within the capsule, which can be screwed apart, lies a small aluminium ball. This moves easily and freely within the capsule, and when it lies above the lower opening it entirely occludes the same. Two cross-bars in the capsule prevent the entrance of the small ball into the tube. If the tube described is attached to an irrigator provided with a waste-pipe, the apparatus is complete. If the waste-pipe is closed, and the water made to run through the douche, the liquid will press the ball downward, thus closing up the large opening. The water will then come out through the small side opening like a very fine shower, sprinkling over quite a large area. The inflowing tube being closed, and the waste-pipe opened, while the capsule is inserted into the liquid, the latter will push the ball upward, and thus the large opening will be free, and the water will easily return through it."

In using this apparatus, "it is necessary to pay attention that the capsule lies immediately below the cardia, and is not situated deeply in the stomach. The length of tubing from the mouth should be sixteen and one-half to seventeen inches. It may be useful to make a mark at this point of the tube. The tube is now attached to the irrigator, the outflowing pipe closed, the inflowing one opened, and the stomach sprinkled with about a quart of water. In order to make the water return from the stomach, the tube is inserted farther into the stomach, about four to six inches, the outflowing pipe opened and the inflowing one closed. . . . The douche may also be connected with two irrigators, one containing cold, the other warm, water; the stomach may thus be sprinkled alternately with cold and warm water."

**Turck's Gyromele.**—The gyromele of Turck has not come into general use, and this I believe is perfectly proper. The instrument consists

* *Diseases of the Stomach*, 4th revised edition, p. 166.

of a terminal sponge which can be made to revolve by a cable running through the stomach tube. It is supposed to effect a stimulation and perfect cleansing of the gastric mucous membrane. Even in skilled hands it is conceivable that it may do much harm when local conditions are favorable to easy traumatism; and the good which it may do can be as well accomplished by lavage and the douche.

(*b*) **Einhorn's Gastric Spray.**—The application of medicaments to the mucous membrane of the stomach in solution is, as a rule, a dangerous procedure, because, in order to bring the medicine into contact with the entire gastric wall, the quantity of drug required passes the limits of safety. Einhorn, therefore, devised the gastric spray apparatus. This apparatus consists of the usual spray with bottle and bulb, to which is attached an extra length of soft-rubber tubing similar in character to that of which the stomach tube is constructed. This tube contains an additional capillary tube, and at the end is a hard-rubber nozzle. It would seem at first sight to be impossible to bring any medicament in this way into contact with the collapsic gastric walls. But the entrance of the spray brings with it considerable air, which distends the stomach, and then it is possible for the medicament to act upon the mucous membrane. To be efficient, spraying of the stomach must be performed only when the organ is empty. Hence, it should be used during fasting or immediately after a lavage. In most instances, a preliminary washing is essential to remove any mucus which may have collected on the gastric surface, and which will interfere with the spray coming in direct contact with the parts. The principal object to be attained by the intra-gastric spray is the production of an astringent effect; though it may be used to a certain extent for local antisepsis and the production of analgesia. The diseases in which it will be found especially serviceable are superficial gastric erosions and chronic gastric catarrah.

(*c*) **Einhorn's Stomach Powder Blower.***—This apparatus, though not much used, should prove to be an invaluable means of direct or local medication of the stomach. The apparatus "consists of an ordinary, not too flexible rubber tube, twenty-eight and a half inches long, the distal end of which connects by means of a hard-rubber piece with an air-suction bulb, the proximal end of which is attached to a hard-rubber piece. The latter is hollow, and pierced with several openings at the side for the passage of air, and provided with a screw-thread for the capsule. The capsule has numerous holes, and is made in three different sizes. It is filled with the necessary quantity of powder by means of a very small spoon, and screwed on to the hard-rubber piece."

The insufflation can only be practiced when the stomach is empty, and should therefore be performed only during fasting or after lavage. Prac-

* *Op. cit.*, p. 173.

tical experiments have demonstrated the reliability of the apparatus. The indications for powdering the stomach, according to Einhorn, are as follows: In ulcer, bismuth; in gastralgia, orthoform; and in erosion, protargol or suprarenal capsule.

(*d*) **Electricity in Diseases of the Stomach.**—Electricity may be used in three ways for the relief of gastric disturbances, namely: (*i*) General faradization; (*ii*) Percutaneous applications over the epigastrium; and (*iii*) Direct electrization, *i. e.*, by the insertion of one electrode into the stomach.

(*i*) *General Faradization.*—This method was developed by Beard and Rockwell, and designs to improve the condition of the stomach by building up the tone of the general nervous system. It is to be applied in cases of gastric neurosis attended by general nervous depreciation. It is hardly to be expected that it will accomplish much when the symptoms are strictly local.

(*ii*) *Percutaneous Applications.*—The discussion as to whether it is possible to exert any effect upon either the secreting structure or the musculature of the stomach by the ordinary methods of percutaneous treatment, does not seem to have been fraught with any definite conclusions, if we are to base our decision upon physiological experiment. The trend of evidence is in the direction of the inutility of such procedures. Nevertheless, numerous cases have been treated by many reliable clinicians in which remarkable improvement has followed the treatment. For the present, therefore, we must abide by the results of clinical experience. Ewald and Einhorn express themselves most positively as to the improvement of the motor faculty of the stomach after percutaneous faradization. One electrode (best a large flat one, as those made from wire gauze and covered with absorbent cotton) is placed over the epigastrium, while the other electrode (an ordinary disc) is applied at about the level of the sixth dorsal vertebra and to the left of the median line. In cases of pure nervous gastralgia (a very rare condition), galvanization should be used. The positive electrode, which should consist of well-covered and moistened wire gauze, is to be placed over the epigastrium. The negative electrode may be applied near the sixth dorsal vertebra, or along the course of the pneumogastrics in the neck.

(*iii*) *Direct Electrization* unquestionably gives the most satisfactory results. King does not regard it with favor owing to the objections of patients and to his confidence in the percutaneous method. As a matter of fact, the sufferings of patients in whom direct electrization is indicated are sufficiently great to cause them to submit to any treatment, however disagreeable it may be. Already a large number of prominent gastrologists have declared in favor of this method.

In the practice of direct electrization, a special intra-gastric electrode

is necessary. Three designs have found favor, namely, those of Einhorn, Ewald, and Bardet. The Stockton electrode is a modification of the latter.

Of these, the *Einhorn instrument* is generally regarded as the most satisfactory. It consists of a hard-rubber capsule with numerous openings, and similar in general shape and size to the "stomach-bucket." Within this capsule is secured a metallic button, which in turn is attached to a long strand of fine wire insulated with soft-rubber. The other end of this wire is fastened to a pin for insertion into the binding-post of the battery. The only valid objection to be urged against the Einhorn electrode is the frail character of the wire, the rubber tube surrounding which is but 1 mm. thick.

The *Ewald intra-gastric electrode* is similar in construction to that of Einhorn, excepting the wire attached to it is somewhat stouter and is more resistant. Hence, it is liable to break, and the patient's efforts at swallowing it may be assisted by the manipulations of the operator.

The *Bardet electrode* consists of an ordinary stomach tube, through which runs a metal conductor, which, however, stops just short of the tube, and does not touch its openings. The objections urged against it is the discomfort attendant upon keeping it *in situ* for the ten minutes necessary for the seance, and the same dangers incidental to the use of the stomach tube itself.

To insert the Einhorn electrode, the patient is first instructed to swallow about a half-pint of water. The capsule is then placed on the back of the tongue and engaged in the pharynx. The patient then endeavors to swallow it by the aid of a glass of water. As a rule, the instrument passes into the stomach without any trouble. At 40 cm. from the capsule the rubber cable should be marked. When this point reaches the line of the teeth, it is known that the instrument has entered the stomach. The outer end of the cord is then attached to the battery, and the circuit completed by the application of the other electrode to the epigastrium or other place, as indicated.

To withdraw the electrode it is only necessary to make traction on its cord. Occasionally, resistance is felt at the *introitus œsophagi.* This may be overcome by requesting the patient to swallow, and at the moment when the larynx ascends traction is again exerted, and the electrode comes out without further trouble.

It has been urged against Einhorn's electrode that it is difficult of introduction. Undoubtedly, there are persons who cannot swallow it any more readily than they can a pill. Under such circumstances the electrode of Bardet may be used.

*Direct electrization of the stomach is indicated in dilatation* of the stomach dependent upon relaxation of muscular structure, and not due to pyloric obstruction, in relaxation of the cardiac and pyloric orifices, severe

gastralgias, and in many cases of gastric neuroses. The current to be used is to be determined on the same principles which govern electrical applications to other portions of the body. Faradization is unquestionably to be selected in all cases of dilatation and muscular insufficiency, and galvanism in cases attended by pain, and in most of the neuroses attended by gastric irritability.

In the practice of gastro-faradization, the outer electrode is first placed over the epigastrium, as already stated. The current should be gradually increased in strength until it is capable of causing contraction of the abdomen, but under no circumstances should it be sufficient to cause pain. Every minute or so the position of the surface electrode should be shifted until it has been passed along the entire region overlying the stomach. Should the patient suffer from constipation, passes should be made over the entire colon. The seance is finally closed by an application to the left of the median line on a level with the sixth or seventh dorsal vertebra. The entire seance should take about ten minutes. The intragastric electrode should be attached to the negative binding-post of the battery.

Gastro-galvanization is practiced in the same way. Care is required that the current be steady and free of interruptions in order to accomplish the best results when symptoms indicative of irritability are present. The current strength should range from fifteen to twenty milliamperes. It is important always to turn the current on and off very gradually. The surface electrode should invariably be of a large size.

Electrical applications may be repeated every other day until improvement is well advanced, when their frequency should be reduced to twice weekly. It is a good plan to continue them once a week for some time after the patient has been restored to health.

(*e*) **Massage in Diseases of the Stomach.**—There seems to be a general feeling that massage is a useful measure in gastric disorders attended by defective motor power. As a matter of fact this is a mere superstition, for experience fails to demonstrate any benefit to be derived from the local treatment. In cases of neurasthenia, and in patients who are too weak to take sufficient exercise, general massage serves to improve general nutritive processes and may be used with advantage.

(*f*) **Hydrotherapy in Diseases of the Stomach.**—Aside from lavage, which has already been described, hydotherapy finds a useful place in the treatment of gastric diseases. So far as the local affect is concerned, the internal use of water is more valuable than is its external application. It has always been the history of useful therapeutic measures that their abuse has lead to their undeserved neglect. So it is with water drinking as a part of the treatment of "the dyspepsias." Prescribed indiscriminately without regard to the pathological condition in hand, and without atten-

tion to detail as to methods, the expected results were not attained; and now we seldom hear of it.

The principal indication for the internal administration of water is gastric catarrh and other conditions in which there is an accumulation of mucus and fermenting materials in the stomach. *It is absolutely essential that the water be administered as hot as can be tolerated.* Under no circumstances must it be drunk rapidly; on the contrary, it should be sipped spoonful after spoonful. It must be taken not less than half an hour before meals. This permits the lapse of sufficient time for it to leave the stomach and give that organ rest before eating. Thus administrated, it acts not only as a cleansing agent, but exerts a reflex stimulating action which greatly improves the strength of the muscular coat. It then proves to be an invaluable remedy in the treatment of chronic gastric catarrh, dilatation of the stomach, and the motor and secretory neuroses.

Water may be used internally as an emetic. For this purpose, the temperature should be lukewarm—*i. e.*, about 85° F. From two to three tumblerfuls should be taken. If vomiting is not excited at once, the fauces should be irritated by the finger or with a feather.

The external use of water has its principal effect in improving the general constitutional tone of the patient. For this purpose, the general hydriatric measures, to be mentioned elsewhere in this work, may be prescribed. As a rule, it will be found that circumstances compel the practice of such treatment in a well-regulated hydrotherapeutic establishment. With a little ingenuity, however, many of the measures may be practiced in the patient's own home. The Scotch douche has been recommended in cases of gastric atony. Water at a temperature of 28° R. is sent with a forcible impact against the epigastrium for ten seconds, and then, without interrupting the flow, the temperature is gradually lowered to 8° R.; and so the seance is continued, alternating the hot and cold application. Of course, all portions of the body not directly treated should be properly protected during the seance.

The *Preissnitz pack* is a useful application in the relief of painful affections. A towel is folded to the size of six by ten inches, well wrung out in *hot* water, and applied to the epigastrium. It is then covered with a layer of gutta-percha or oiled silk, and the whole is held in place by a snug flannel binder.

We may also use spongio-piline, also well wrung out in hot water, as an application to the epigastrium.

The majority of people do not take enough water. A very mistaken notion prevails to the effect that it is bad to drink too much, because water dilutes the gastric juice, and interferes greatly with digestion. There is a right and a wrong way of drinking. To swallow a whole tumblerful of ice water almost at one gulp, is unquestionably a pernicious practice; but

to drink slowly, when there is no food in the mouth, is another matter entirely. A liberal supply of water is as essential to good health as is a good supply of food. Especially is the water important in patients who partake freely of nitrogenous food. One of the chief advantages of a milk diet is, doubtless, the large quantity of fluid introduced thereby into the system. The same is true to a less degree of the grape cure and the whey cure. To make what is a true comparison, if one wants a good fire, he must not only supply fuel, but he must make disposition of the ashes. We supply food to the body, the nutritious elements are assimilated, and we must provide a means for the elimination of the excrementitious substances. Water is the universal solvent. Just as we use it for washing and flushing our drains, so may it act to flush the system, and take away the excrementitious substances; to clear out the urea, uric acid, and phosphates, by the kidneys; to wash the liver; and to aid the action of the bowels. A glass of water on retiring, and another on getting up in the morning, is a very simple, and ofttimes efficacious remedy for constipation. I have often been very much surprised on inspecting my patients' diet lists to find the very small quantity of water taken. Only this day, a man applied to me for the treatment of an universal pruritus. He was a highly neurotic subject, and had been so for ten or dozen years. His diet consisted very largely of highly nitrogenized food; and yet he hardly drank four ounces of water daily. Among other things, he was directed to drink three pints of water daily.

There is not infrequently some difficulty in getting patients to take water in these unaccustomed quantities. This is usually overcome by ordering some of the well-known mineral waters. Whether these waters have any real medicinal value aside from the $H_2O$, I do not know. My own opinion is in favor of the idea that it is water that does the work. There is a good deal of superstition surrounding this subject. Magnetic waters and waters of other kinds are credited with almost supernatural powers. Thus, one man will tell us that he has actually seen a urinary calculus dissolve in ——— water. In other cases we see the labels on the bottles stating that the contained water cures dyspepsia, nervousness, lithæmia, gout, gravel, calculus, rheumatism, consumption, and Bright's disease. I feel that the time has come for us to know, beyond all cavil, if the mineral waters do exert effects of which plain $H_2O$ is incapable. There is one advantage, however, that does attend the administration of spring water, and that is their purity is such that one can far more readily drink the large quantities necessary than if he were obliged to rely upon the quality provided for public consumption, at least if it is such as we get in most large cities.

The carbonated waters are of therapeutic value. In the first place, they unquestionably increase the salivary flow, and the saliva has digestive

functions. Roberts's experiments apparently show a contrary result, as he says water charged with pure carbonic acid gas arrested salivary secretions. But when he employed the ordinary waters of commerce, which contain a slight amount of alkali in addition to the gas, this inhibitory effect was entirely removed. One need only to indulge in these waters for himself to find that they do excite a salivary flow; whether because they are pleasing to the taste, or from a direct stimulating influence, I do not pretend to say. Their use as table-waters is well-nigh universal. This practice must, therefore, be prompted by experience. Roberts has shown by experiment that they distinctly aid peptic digestion. This effect he believes is due entirely to the effervescence stirring up the stomach contents, thus securing a more thorough and a more prompt admixture with the gastric juice. It would hardly seem possible that this can be the proper explanation, for, taken as these waters are, in small sips in the course of a meal, there can be but little activity in the contained gas.

(*g*) **Surgery of the Stomach.**—The radical statement of a few enthusiasts has caused the general profession to look upon gastric surgery with feelings of suspicion. As examples of the wild statements made, I may refer to one surgeon who asserts that practically all chronic indigestions are secondary to gastric ulcerations, and are amenable to surgical measures. He even goes so far as to make the plea that the internist shall send his cases of chronic dyspepsia to the externist, and that prompt cures will result. Talk of this kind drives the thinking, conservative physician and surgeon to the other extreme.

But gastric surgery has a field and an important one. In some cases the indications are unequivocal, as gastrostomy for cicatricial stenosis of the œsophagus and cardiac orifice of the stomach, thereby enabling a starving patient to be fed, and even to provide means for dilating the stricture from below.

In a general way the indications for surgical intervention in diseases of the stomach are as follows:

1. **The exploratory operation** to be performed in cases in which the diagnosis is doubtful, the symptoms favoring the probability that the disease is one amenable to operation. One can never be certain that the conditions demanding operation for curative purposes are present; hence the necessity for exploration. One should not rush to exploratory laparotomy as if it were a trifle until he is assured that his patient's chances are bad without it. Let me illustrate. During the past winter, one of my patients at the Hahnemann Hospital was suffering from obstinate vomiting. He had previously gone through a course of treatment for gastric ulcer under the supervision of one of America's greatest gastrologists. He was emaciating rapidly. There was no sign of tumor. The stomach was not dilated. The gastric analyses were negative. Tests showed that the

stomach emptied itself over night. The exploration performed by Dr. W. B. Van Lennep showed an old pyloric ciacatrix with adhesions to adjacent structures. In certain positions, and with the stomach distended partially and making traction, the pylorus knuckled. The case recovered after liberation of adhesions and subsequent gastro-enterostomy.

2. **Inability of the stomach to empty itself** is probably the most important indication for operation. Of course, every case of defective motor power is not of a surgical character. But whenever there is evidence of pyloric stenosis, whether malignant or benign, a gastro-enterostomy is indicated. The objection may be urged that the majority of these stenoses are malignant, and must soon die no matter what the treatment. The reply to this is that one can never be certain that the stenosis is malignant. I have seen two cases in which all interested concurred in believing the disease to be malignant, and yet the autopsies demonstrated otherwise.

3. **The removal of lesions** which existing in any other part of the body calls for operation. Here we would place tumors.

4. **The cure of hæmorrhage** after medicine fails.

5. **The cure of ulcer** when medical treatment has failed.

6. **The cure of the effects of ulcer,** as adhesions, cicatricial distortions, stenoses, hour-glass contractions, abscesses, and perforations.

Additional remarks concerning the special indications for surgical interference will be found in the discussion of the various lesions having a bearing on the above-mentioned headings, and in a special section by Dr. Van Lennep.

## Concerning the Treatment of Some of the More Important Gastric Symptoms.

Of course, the prime object of treatment is to effect a cure. Treatment directed in this direction brings about general relief. But there are symptoms which for the time being cause such intense suffering as to interfere sadly with the patient's progress, to say nothing of the distress they occasion for a time at least.

**Pain.**—In all cases of pain from disease of the stomach the first indication is rest. It is of the highest importance that the patient be sent to bed, and made as comfortable as circumstances will permit. This, of itself, will very frequently bring about the desired relief. As to diet, the patient with epigastric pain wants nothing. His stomach should have a rest. With the subsidence of the attack he should be given liquid food at first; his regular diet should not be permitted for two or three days after the subsidence of all symptoms. For the relief of epigastric pain, there is no drug which compares with the opium alkaloids, Morphia and Codeia. The former is decidedly the more reliable of the two. It is best given hypodermically in a single dose of one fourth of a grain combined with a one

one-hundred and twentieth of a grain of Atropine sulphate. There is no disease of the stomach calling for its temporary use in which it is contra-indicated by reason of the possibility of its doing harm. Smaller doses than the one specified are not likely to prove palliative in cases in which the pains are sufficiently severe to demand palliative treatment. In the acute disorders of the stomach it is hardly likely that more than one dose will be required. Of the diseases coming under this head, acute toxic gastritis and gastralgia are the chief. In chronic disorders of the stomach attended by pain, Morphia should not be used unless one is driven to it by the failure to obtain relief by other measures, and the undermining of the patient's constitution by the long-continued suffering. Exception to this statement may be made in the case of an incurable painful affection like carcinoma, in which the production of the Morphia habit is of no importance.

*Codeia* is best given in the form of the phosphate, in doses of one-half grain every three or four hours until satisfactory relief has been obtained. For long-continued administration it is not a desirable medicine, although the liability of forming a drug-habit is not as great as in the case of Morphia. It is the principal medicine commonly recommended for the relief of the pains of gastric ulcer.

Externally, hot applications are invaluable. Indeed, their use may make palliative medication entirely unnecessary.

When the case has been under observation for some time, and all its peculiarities are understood, numerous ideas for the prevention of attacks will present themselves to the mind of the physician. These for the most part consist of hygienic and dietetic measures suggested by the previous habits of the individual. Thus, in acute toxic gastritis, the ridding of the stomach of all contents ; in gastric ulcer, the prescription of a liquid diet in small quantities, or even forbidding food by the mouth altogether will do much for the comfort of the patient.

The local application of cocaine by the gastric spray, as recommended by Einhorn and others, does not appeal to me as a desirable method of treatment. That it will bring relief is more than probable, but the discomfort attending the application, and the liability of forming the cocaine habit, if the practice is long-continued, should make one hesitate before resorting to it.

Of the remedies having a curative action, *Belladonna* is the one that will be found to be the most frequently indicated. Its use is suggested by the sudden onset and severity of the pain. There is more or less sensitiveness to pressure. It is best adapted to the pains of acute gastritis and gastralgia.

*Arsenicum album* will be found useful in the alleviation of pains, apparently of gastritic origin, burning in character, and attended by irritability of the stomach, as exhibited by the intolerance of that organ for all food

and drink, and the intolerable thirst. It is indicated all the more strongly in cases in which there has been excessive indulgence in iced drinks, alcohol, and tobacco. There is always more or less exhaustion of the nervous system. It is best administered in the 3x trituration, one tablet every hour.

*Argentum nitricum* is indicated when the pains are attended by considerable flatulence. The pains are gnawing and ulcerative in character, and radiate in various directions with the epigastrium as their centre. The neurasthenic element is generally prominent, and is exhibited, as a rule, by mental depression and anxiety. It should be given in the 2x trituration tablets every two hours, or in gelatine-coated pills of one-quarter of a grain each, four times daily. The pathological conditions indicating it are *chronic catarrhal gastritis*, *gastric ulcer*, and the *painful neuroses*. It is probably the best remedy for the *gastric crises of locomotor ataxia*.

*Bismuth* may also be used for the relief of gastralgic pains, the special indication for its administration being the associated vomiting. For this purpose it should be given in the 1x trituration, one tablet every hour.

*Ignatia amara* is indicated in gastric pains of hysterical subjects. Etiological factors furnish the chief special indications. It may be given in from the 1x to the 3x dilutions every hour. Associated symptoms include hiccough, empty retching, relieved by eating, salivation, and empty, gone feeling in the epigastrium.

For additional remarks concerning the relief of the pain attendant upon diseases of the stomach, the reader is referred to the paragraphs devoted to the therapeutics of acute and chronic gastritis, gastralgia, and ulcer and carcinoma of the stomach.

The discomfort arising from the various neuroses rarely amounts to actual pain. Very little can be done in the way of giving the patient prompt relief during acute exacerbations. The treatment resolves itself entirely into the improvement of the tone of the nervous system ; in other words, the fundamental cause must be cured. When due to flatulence, the administration of carminatives may bring relief. At times, the discomfort disappears after taking food, or by the application of dry heat to the epigastrium.

A class of epigastric pains not commonly recognized by practitioners are those of arterio-sclerotic origin. They are undoubtedly very common, and prove obstinate to the treatment because they are not correctly diagnosed. They are observed in individuals at or beyond middle life, and are associated with clinical evidences of arterio-sclerosis elsewhere. The attacks of pain are brought on by over-exertion, especially from ascending a height. Tenderness of the abdominal aorta and even of its branches is placed by Buch as among the diagnostic symptoms. The condition of the arteries, the increased vascular pressure, and the accentuation of the aortic second

sound with evidences of renal inadequacy assist in the diagnosis. The treatment for the most part is that of arterio-sclerosis in general. Such patients are greatly benefited by Strophanthus. In addition, the physician may employ such measures as may be indicated to increase renal elimination.

**Flatulence.**—In the treatment of flatulence due regard must be had as to its origin. As stated in the diagnostic volume of this work, it may be dependent upon decomposition of food, or upon purely neurotic causes. In both cases, the principal treatment relates to the radical cure of the trouble calling forth this symptom. Dietetic habits constitute an important cause of the organic flatulence. In the neurotic variety they are of less importance, especially as relates to the kind of food taken. It is important always that the patient eat regularly and slowly; that he take sufficient time to his meal to insure perfect mastication of food, and its thorough admixture with the alkaline saliva. In organic flatulence, that due to fermentation and decomposition, starches and sweets must be prohibited as far as possible. Foods rich in cellulose, as cabbage, must be positively prohibited.

When flatulence has become a regular thing for the patient, his eating routine should be regulated. He must avoid liquids entirely at the beginning of his meals. He may have his usual liquids, as water, coffee, etc., but they must not be taken until he has disposed of the solid food. Sometimes exception may be made to the taking of soup at the beginning of his dinner.

In all cases the use of tea must be forbidden as positively deleterious.

For the relief of flatulence dependent upon the presence of decomposing food, the most efficient remedy is lavage. Only severe and obstinate cases will submit to this measure.

The medicines which may be prescribed to meet the condition include *Nux vomica*, *Carbo veg.*, *Bismuth subgallate*, and *Lycopodium*.

*Nux vomica* is beneficial mainly by reason of its influence over the functions of the stomach. Causal indications include indulgence in alcohol and tobacco, long addiction to purgatives, sedentary habits; the symptomatic indications are constipation, bad taste in the mouth, coated tongue, dull headache, and aggravation of all symptoms in the morning.

*Carbo veg.* is adapted to cases of flatulence in which the eructed gases exhibit an offensive taste or odor. Appetite is completely gone. Causal indications include indulgence in rich foods and debauchery. For immediate relief, it may be used in crude form as recommended by Leared. The charcoal used for this purpose should be re-ignited in an iron capsule, and bottled while still hot. It should be kept carefully protected from the air. The dose should be a heaping teaspoonful taken in capsules or wafers.

*Lycopodium* is in common use for the flatulent dyspepsias of the gouty and lithæmic. Epigastric distress appears immediately after eating a very

small quantity of food. The fact that the liver is affected is shown by a sensitiveness over the right hypochondrium. The bowels are usually constipated with ineffectual urging to stool.

*Bismuth subgallate* is a most excellent remedy in catarrhal dyspepsias with excessive flatulence, when ordinary remedies fail. It has been so highly praised as a remedy for flatulence that its indiscriminate use for the relief of this symptom is pretty sure to discredit it. It has no application to the general run of neurotic dyspepsias, unless they are attended by some local catarrhal changes. It should be given in doses of ten grains, three times daily, about half an hour before meals. *Orphol or beta-naphthol bismuth* is highly praised as adapted to the same conditions for which I have recommended the subgallate. So far as I can see, it is no more efficient than the subgallate, and is limited in its ability to relieve the neurotic cases.

Palliatives are often required for the relief of flatulence, owing to the high degree of distress and anxiety attendant upon the seizures or attacks. The most efficient of this class of drugs is Hoffman's anodyne, which should be given in doses of one to two drachms to an adult, and in ice-cold water.

Of the newer preparations, *Vallidol*, which is a compound of Menthol and Valerianic acid, is excellent in ten drop doses on a lump of sugar.

The milk of *Asafœtida* in doses of one to eight ounces is used as a rectal enema by some practitioners.

In cases of flatulence dependent upon atony of the intestinal muscle, the best remedy is *Calabar bean* or *Physostigma*, in doses of one minim of the fluid extract three times daily. It increases the tonicity of the intestinal muscles and helps the constipation as well as the flatulence.

Many cases of flatulence in persons of advanced life are due to gastro-intestinal arterio-sclerosis. Such are capable of great amelioration under the ordinary treatment for that condition together with *Strophanthus* in doses of one to three minims, three times daily. When the vascular pressure is low, *Digitalis* may be given instead of the Strophanthus.

The neurotic cases, as explained in my volume on Diagnosis, are almost always dependent upon air-swallowing. It has been demonstrated by Mathieu that in many of the cases, what is called eructation is in reality aërophagia. The patient experiences discomfort in the epigastrium. She imagines this to be due to accumulation of gas, and makes efforts to dislodge it. In reality, she does the reverse. Finally, the stomach becomes distended with air. The only available treatment in these cases is found in a plain talk with the patient, explaining to her the mechanism of the so-called flatulence. If this is done with tact, and the trouble has not gone on too long, the difficulty may be readily overcome. To assist the patient in restraining the swallowing efforts, she should be directed to keep the mouth slightly open, as swallowing is impossible in this position. In extreme and old cases a gag should be placed between the teeth.

The confirmed cases can be treated only on the lines laid down in the article on hysteria. The majority require to be sent away from home.

Our treatment must be directed entirely to improvement of the general nervous condition. But little or nothing can be done for temporary relief. The drugs classed as aromatics or carminatives do help some. Ginger is sometimes of use; but the relief is not of a signal character. The maltreatment of these cases is usually in the direction of the administration of remedies for the heart, owing to the associated disturbances of the function of that organ. In reality, the entire attention of therapeutists should be directed to the condition of the patient between attacks. For the treatment of this the reader is referred to the several paragraphs devoted to the gastric neuroses.

**Vomiting.**—The treatment of vomiting as a symptom depends very much upon the attendant circumstances. Occurring in the acute disorders of the stomach, it is generally a conservative symptom, and unless of sufficient severity to be a source of great suffering, or unless it continues long after the stomach has been rid of offending materials, it should be let severely alone; in fact, it may be encouraged with advantage. In all cases, we should look to the condition back of the vomiting in planning our treatment. In acute cases we endeavor to overcome the gastric irritability by some simple means. Thus, we may administer small pieces of ice at short intervals; or we may have the patient drink *hot* water. In cases of toxic gastritis after the poison has been removed, and the patient vomits nothing but mucus or serum, and the frequent repetition of the act is wearing out the patient's strength, an eighth or a quarter of a grain of Morphia may be given hypodermically. So far as food is concerned, the stomach should be given absolute rest. Fortunately, it is not a difficult thing to do this, for, as a rule, the disgust for food is complete. But with returning health there will be a craving for something, and then such light foodstuffs as wine whey, albumen water, toast water, rice water, milk with lime water or vichy, or milk toast may be permitted. But even these should be given sparingly.

In the treatment of chronic vomiting, attention must be paid to the underlying conditions. Excepting in gastric ulcer, lavage will ofttimes be found of remarkable efficiency.

The remedies most frequently indicated include Ipecac, Nux vomica, Bismuth, Antimonium tart., Creosote, Glonoin, and Veratrum album.

*Ipecacuanha* is the remedy for vomiting in connection with the acute gastric catarrh. Nausea is a prominent attendant. The tongue is clean. Its use was popularized among old-school physicians by Ringer, who advocated hourly doses of one minim of the tincture.

*Nux vomica* is indicated in the morning vomiting of those addicted to alcoholic indulgence.

*Antimonium crudum* is useful in the vomiting of chronic gastric catarrh. Nausea is a prominent feature. The tongue is heavily coated white. It is an important remedy in the vomiting attendant upon gastric disturbance of children. Vomiting due to overloading of the stomach or taking indigestible substances, as fat food; vomiting from hot weather.

*Creosote* is indicated in the treatment of persistent vomiting which may take place either immediately or hours after eating. The functions of the stomach are in abeyance, for the vomited matters show no changes by digestion. *Carbolic acid* is indicated in cases similar to those calling for Creosote. Creosote is especially useful in the vomiting of phthisis, cancer, and chronic nephritis.

*Glonoin* is the best remedy for the vomiting due to arterio-sclerosis. The condition is essentially of cerebral origin. Associated symptoms are high vascular pressure, albuminuria, and cardiac hypertrophy. The dose should be one drop of the 2x dilution three or four times daily.

*Apomorphia* is also adapted to cases of cerebral vomiting. It should be used when there are no associated symptoms to suggest any other remedy. It may be given in the 3x trituration, one grain every hour.

*Belladonna* is another remedy adapted to cases of cerebral vomiting, but when useful, there must be the characteristic cerebral symptoms of that medicine. In children suffering from brain affections, *Camphor monobromide* sometimes relieves the vomiting; but it usually requires to be given in material doses.

The *bismuth preparations* are excellent in securing a sedative action of the stomach in chronic catarrhal conditions. They must be given in material doses.

*Veratrum album* is indicated in the violent vomiting associated with acute gastro-enteritis.

Some cases of vomiting resist the ordinary measures as above outlined, compelling the practice of rectal alimentation for several days.

**Anorexia.**—Ordinarily, loss of appetite is a conservative symptom and should not be interfered with. When the patient recovers from his primary illness the appetite will return. Occasionally, however, one must direct his attention to the treatment of this symptom *per se*. The principal hygienic measures are found in fresh air and mild exercise. These failing, one may resort to one of the following remedies:

*Cinchona* in doses of five drops of the tincture every two hours in the anorexia succeeding acute and debilitating diseases.

*Strychnia* in grain doses of the 2x trituration in the anorexia of the average neurasthenic.

*Orexine* may be given in five to ten grain doses in capsule, half an hour before meals, for stimulating an appetite in persons who apparently have no other complaint.

Much may be done by offering tempting dishes, of the preparation of which the patient has had no previous knowledge. The taking of wines, ale, beer, or malt extract with meals is ofttimes highly beneficial.

**Thirst.**—Gastric disorders associated with thirst are usually of such a character as to demand that but little as possible be taken into the stomach. It is well, therefore, to relieve this symptom with as small quantities of liquid as possible. This may be accomplished by giving barley water, toast-water, effervescent drinks, diluted acid drinks, especially those of oranges, lemons, and grapes.

**Gastric Hæmorrhage.**—Immediately after the vomiting of blood, even in small quantities, it is essential that the patient be put to bed, and his rest made absolute. He must not be permitted to rise for any purpose whatever. The bed-pan must be used when he wishes to empty his bowels or bladder. Even talking must be forbidden. Feeding by the mouth must be stopped, and rectal alimentation instituted. In the majority of cases, these measures are all-sufficient.

Sometimes, however, we must resort to medicines to assist the hygienic measures just recommended. If the bleeding is passive, *Hamamelis* or *Erigeron* in five drop doses of the tincture will prove valuable. Styptics have been recommended. Those most in use include Monsel's salt, tannic acid, gallic acid. As preparations of iron and tannic acid are incompatible, these medicines must not be given in the same case. *Monsel's solution* may be administered in doses of three drops in half a glass of water every fifteen minutes for one hour. *Tannic acid* may be given in one dose of twenty grains in form of pill or capsule.

The *Hydrochlorate of Hydrastinine* may be prescribed hypodermically in doses of one-eighth to a quarter of a grain.

When the stomach is irritable, and the resultant retching or vomiting tends to perpetuate the hæmorrhage, the principle of rest should be enforced by the hypodermic injection of one-fourth of a grain of *Morphia.* This puts the stomach in a splint, so to speak.

*Ergot* and its preparations are in common use among old-school physicians. Opinions differ as to the result of its administration. Its utility is based upon the ability of the drug to produce arterial contraction. This being the case, it should also increase intra-vascular pressure. It would seem therefore that it is a drug of doubtful utility, if not positively harmful. As already stated, hæmatemesis is commonly not a serious accident, as it disappears promptly when the patient is placed under favorable hygienic conditions. It would seem unwise therefore to recommend a drug concerning which so divergent views exist.

*Ipecacuanha* is indicated in cases in which the hæmatemesis is attended by considerable nausea.

*Aconite*, when it is associated with considerable nervousness and anxiety.

*Arnica* should be administered in the traumatic cases. *Hamamelis* and *Rhus tox.* may also be thought of in this connection.

*Glonoin* 2x is the best remedy for the hæmatemesis associated with arterio-sclerosis and interstitial nephritis. It acts by relieving the high arterial tension. *Aconite* is sometimes useful in these cases.

Hæmatemesis associated with gastritis calls for *Belladonna.*

*Cinchona* in five drop doses of the tincture every one or two hours is the best remedy for the exhaustion succeeding severe hæmatemesis.

When the collapse following the hæmorrhage is great, it is necessary to resort to intravenous or hypodermic injections of normal salt solution.

It is well to secure as far as possible a steady contraction of the walls of the stomach, as this must necessarily lessen the calibre of the blood-vessels. For this purpose, nothing is better than keeping the stomach absolutely empty. It has been suggested that Ergot acts beneficially in the treatment of gastric hæmorrhage because it produces contractions of the muscular layer of the stomach. It may have this effect, but it is doubtful if it is as energetic in its action on this organ as it is in the case of the uterus.

The application of the ice-bag to the epigastrium acts reflexly to contract the gastric walls. The internal use of ice in small quantities appeals to one at first sight to be a rational measure. But when one pauses to think, and thus notes that the small pieces of ice melt so quickly in the stomach, that their administration practically amounts to the introduction of just so much warm water.

Approximately, 95 per cent. of cases of hæmatemesis will yield to the medical measures above described. Of the balance about one-half will be fulminating, and will end fatally before any treatment, medical or surgical, can be instituted. There then remains a small percentage which will require surgical interference for their cure. Notwithstanding the relatively small number of these cases, each patient with hæmatemesis may, notwithstanding the apparent mildness of his symptoms, ultimately come within the list of that small minority. It therefore behooves the physician in all cases in which it is impossible to have surgical advice, at least to keep in touch with a surgeon should emergency arise.

When medical treatment is to be successful, there will be an amelioration of symptoms within a very few hours, and by twelve to eighteen hours at the outside, it is evident that all danger has passed. If during this time the symptoms show no abatement, it is evident that medicine is useless and the surgeon must enter and take charge.

The cases which are likely to demand surgical intervention are usually those in which a large bloodvessel has been opened. In these cases we have a sudden outpouring of blood, and an investigation into the history of the case shows that the patient has an ulcer.

Another very good rule to guide us to operation is the recurrence of the hæmorrhage. Every case with a recurrence ought to be operated. If a third hæmorrhage takes place, the physician is guilty of reprehensible conduct if he does not insist upon turning the case over to the surgeon.

The operation by preference is a posterior gastro-enterostomy, which by giving the stomach absolute rest effects a cure. If, however, the surgeon discovers a bleeding vessel at the time of the operation, he should first secure it by ligature, after which he may proceed with such measures as may be necessary for the removal of the primary lesion—usually an ulceration.

## The Treatment of the Various Diseases of the Stomach.

### Acute Catarrhal Gastritis.

The natural course of this disease is towards recovery, providing the patient submits to conditions which will enable nature to exert its reparative processes. Inasmuch as the vast majority of cases have resulted from overloading of the stomach or of the taking of indigestible substances, and as a result, there is not uncommonly a mass of fermenting material in that organ, it is an important measure to excite vomiting at once. This may be done most conveniently by the use of warm water. Emetic drugs, as Apomorphia and Ipecac, are not to be thought of, as their effects add only to the patient's discomfort. If the case should come under observation at a period at which it is more than probable that the products of imperfect indigestion have passed into the intestinal canal, and the bowels are constipated, it will generally prove to be a wise plan to administer a purge for its cleansing effect. For this purpose, three to five grains of calomel or a dose of citrate of magnesia will prove the most satisfactory.

Cases presenting vomiting and purging as prominent symptoms do not require the above treatment. As long as the vomited matters consist of the products of digestion, the vomiting should not be interfered with. When, however, empty retching sets in, it is time to allay the gastric irritability, which may best be done by some simple measure as the administration of small pieces of ice together with such medicines as *Ipecac*, *Nux vomica*, and *Arsenicum*. The purging likewise being a conservative symptom should be let alone, unless it tends to exhaust the patient. As a rule, however, it does not continue longer than the pathological condition requires.

As to diet, the patient at first requires little or no food. In the first place, the stomach will not tolerate its presence ; and, in the second, the state of nutrition will permit a day or so of semi-starvation without detriment. At the most, rice water, barley water, or weak tea may be given sparingly. When, however, active symptoms have subsided, there

may be permitted a gradual return to the normal diet. Milk will be found to be the most suitable food on which to begin the feeding process. If the case has been a severe one, the milk had better be diluted with barley or lime water, and given in small doses (four ounces) at short intervals (three hours). Then in order may be recommended milk toast, dry toast, gruels, one soft-boiled egg, raw oysters, broiled chicken, broiled chops, etc. The full diet of solid food should not be ordered until about the fourth or fifth day. It may be that the patient's feelings will cause craving for something solid before that time, but his ultimate benefit demands a conservatism in forcing the stomach to its wonted functional activity.

In the mild cases in which the symptoms are not sufficiently severe to cause the patient to take to his bed, a milk or milk toast diet for twenty-four hours, and gruels, oysters (raw), and not too fresh bread the next day, with a light solid diet the following one, will be all-sufficient.

The drinking of water will depend very largely upon the feelings of the patient, and its effect upon the stomach.

Nux vomica and Arsenicum are the remedies which will prove beneficial in the majority of cases. *Nux vomica* is indicated in cases produced by overloading of the stomach or by indulgence in alcoholic liquors. The patient experiences dryness of the mouth, a disagreeable or bitter taste, especially in the morning, discomfort in the epigastrium, and constipation with ineffectual urging to stool. Vomiting may be present; but, as a rule, in the Nux vomica case, retching predominates over actual emesis.

*Arsenicum* presents as causal indications indulgence in alcohol, iced drinks, and spoiled foods. The stomach is unduly irritable, as evidenced by the vomiting, which is excited by the taking of the lightest kind of food or drink, even in small quantities. The patient suffers from restlessness and thirst. There is burning pain in the epigastrium. The bowels are loose. The Arsenicum case is almost invariably of the more severe type, and is usually associated with fever.

*Bryonia* is the remedy for the acute gastric catarrhs occurring during the hot summer months. The tongue is coated a heavy white, the patient complains of a putrid taste in the mouth, and of a sensation as of a heavy load in the stomach. As a rule, the bowels are constipated. Nevertheless, diarrhœa may be present, and Bryonia be none the less indicated, if the stools are papescent and putrid.

*Ipecacuanha* is indicated in acute gastric catarrh when the prominent symptom is nausea in association with clean tongue. Causal indications include indulgence in pastry, sweets, and other indigestible substances, and chilling the stomach by free libations of ice water.

*Antimonium crudum* may be used in cases similar to those calling for Ipecac, but with the difference that it is to be used when the tongue is coated a heavy white.

*Gelsemium* is probably the best remedy in febrile cases which do not present the gastric irritability observed when Arsenic is indicated. *Bryonia* and *Baptisia* have also been recommended in the febrile cases.

### Acute Toxic Gastritis.

The important part of the treatment of acute toxic gastritis is the removal of the poisonous material as soon as possible. Vomiting may be produced most quickly by the hypodermic administration of one-tenth of a grain of Apomorphia. If the stomach tube is available, thorough lavage may be practiced. Exception to the above directions should be taken in cases of poisoning by the mineral acids and caustic alkalies, which, by reason of their chemical action upon the walls of the stomach, render any mechanical interference with that organ dangerous. Our treatment must then be limited to the administration of chemical antidotes, as calcined magnesia in the proportion of three ounces to a pint of water in the case of acid poisoning; and the free exhibition of lemon juice, tartaric acid and vinegar, when caustic alkalies have been swallowed.

This seems to be the most appropriate place in which to consider the treatment of poisoning by corrosive chemicals, which, by the way, are the ones capable of producing acute toxic gastritis. The general principles involved in the treatment include the administration of the appropriate antidote, and the prompt washing out of the stomach. Subsequent symptoms are to be treated according to the indications present.

*Corrosive Sublimate.*—The antidote to poisoning by corrosive sublimate is the white of egg, which combines with the salt in solution to form the insoluble albuminate of mercury. Immediately thereafter the stomach tube should be used. Symptoms requiring especial attention include the collapse, to be treated by applications of heat; failure of heart and respiration, to be combated by the administration of stimulants; and pain, to be relieved by the hypodermic injection of morphia. When the poisoning is at all severe, the patient generally has a tedious convalescence, due in the main to the serious effects of the poison on the gastro-intestinal tract and the kidneys. The gastro-intestinal symptoms necessitate the enforcement of a soothing easily digested food, of which milk is the most important. The renal condition is to be treated by liquid diet, as milk, broths, and plenty of pure water; and the internal administration of Cantharides in the 2x or 3x.

*Arsenicum album; Arsenious Acid.*—The most satisfactory antidote of arsenic is the freshly prepared sesquioxide of iron. Inasmuch as it takes time to send to the druggist for this, it is well to know that it can be prepared in a few minutes by the neutralization of the tincture of the perchloride of iron by a solution of carbonate of soda. Dialyzed iron may also be used for the purpose. It is not as reliable as the sesquioxide, however.

It must be understood that the antidote in this as in any other case, can only neutralize the poison that happens to be in solution. It is important, therefore, that the washing out of the stomach or the emesis be proceeded with as soon as possible. The subsequent gastro-intestinal irritation may require the use of morphia to make the patient comfortable. Among the more important chronic effects of arsenical poisoning is a multiple neuritis. This is to be treated in the same way as neuritis from any other cause, rest, massage and electricity being valuable adjuvants.

*Oxalic Acid.*—This poison should be neutralized as soon as possible by the administration of a preparation of lime, so as to form the insoluble oxalate of lime, which is inert. Saccharated solution of lime, or a mixture of lime and water may be prescribed. Failing to obtain these, magnesia may be administered, as it forms an insoluble oxalate. The salts of potassium and sodium are inadmissible, because the oxalates of these metals are as poisonous as the acid itself. After washing out the stomach, free drinking of water is indicated as an eliminant. Should collapsic symptoms be present, stimulation is called for.

*Phosphorus.*—The antidotal treatment of phosphorus poisoning is not satisfactory. The antidote generally recommended is sulphate of copper, which may be administered as an emetic, so it is said. The remedy does not seem to be a safe one, for it is scarcely less poisonous than the phosphorus itself. One certainly should not go farther in its use than the administration of a few drops of a 1 per cent. solution, in the hope of forming the insoluble phosphate of copper. Inasmuch as symptoms are often deferred until several hours after the poison has been taken, the administration of antidotes is at the best of doubtful expediency. The stomach should, of course, be thoroughly washed. Under no circumstances should oils of any kind be administered, because they only intensify the action of the phosphorus by rendering it soluble. Inasmuch as the intestines generally contain some of the poison, saline purges and high colon douching are indicated. Hare recommends as the best antidotes for phosphorus poisoning, 1 per cent. solution of permanganate of potassium and peroxide of hydrogen. For the associated collapse, the hypodermic administration of camphorated oil is valuable.

Complications and sequelae of corrosive poisoning require special measures according to their nature. This may be either medicinal or surgical. For information concerning the treatment of these, the reader is referred to other portions of this volume.

### Phlegmonous Gastritis.

In view of the almost inevitably fatal result of phlegmonous gastritis, no treatment can be regarded as satisfactory. One can only recommend a course of procedure that will make the patient as comfortable as possible

under the circumstances. To this end, the intense inflammation may be combated by the application of hot poultices over the epigastrium. Ice-cold compresses have also been recommended. The associated pain and collapse must be treated symptomatically. The remedies which are indicated on theoretical grounds (only 51 cases of the disease are on record, hence individual experience is not great) are *Mercurius corrosivus, Carbolic acid, Arsenicum, Lachesis*, and *Chininum arsenicosum.*

Three cases have been treated surgically with two deaths and one recovery. Whenever there are unequivocal indications of the formation of pus, operation is indicated after exploratory puncture has established the correctness of the diagnosis. Such cases must terminate fatally without operation.

## Ulcer of the Stomach.

Between the extremes of view that gastric ulcer is to be treated medically or surgically, there is a happy and golden mean. Unless there are distinct indications to the contrary, all cases should be regarded as medical in the beginning. In following out the plan of treatment proposed in these pages, it must be remembered that we expect definite results to follow, and a certain amount of improvement to be observed in schedule time. If the physician's expectations in this respect are not realized, then he must abandon his conservative efforts, and pass the case over to the surgeon. To outline the degree of improvement to be expected in any given instance is impossible, as cases vary so in their symptomatologies and patients in their powers of reaction, the question can be decided only from ripe judgment and experience, and not by any rule of thumb.

A "cure" will probably result in 95 per cent. of the cases treated medically. But the new questions arise: Are these "cures" permanent? Do any of the cases relapse? Do secondary lesions follow cicatrization? Undoubtedly many cases do relapse and all recoveries are not complete, for some are only relative. Unfortunately, likewise, secondary lesions following cicatrization are by no means uncommon. Nevertheless, it is our duty to give all patients the benefit of the chances from medical treatment, which I now proceed to describe.

The sole indication other than the administration of medicines in the treatment of gastric ulcer is local and general rest. To the full accomplishment of this end, attention to numerous details is absolutely necessary. As subordinate portions of the treatment, nutrition of the patient must be maintained, suffering must be relieved, and complications must be combated.

The rest must be absolute, and must be continued for a period of three weeks. Patients will object to this, as it takes them away from their usual occupations, and resent it as unnecessarily severe when they are able to go about with comparative comfort. No compromise should be allowed on

this point. The most that can be conceded is the reduction of the period of confinement in bed to two weeks. In view of the seriousness of the disease, the liability to relapse, and the prospect thereby of going through the treatment once more, it is well to make the result as certain as human affairs can be made by insisting upon the full period. The greatest attention should be paid to detail in enforcing this rest. The patient must not be permitted to rise for either stool or urination. He must not be permitted to see company, for his friends will surely lead him to talk and laugh, and these acts involve more or less the movement of the diaphragm, which in turn is imparted to the stomach. *Rest in the treatment of ulcer of the stomach means rest.* Carried out as it should be, it is irksome, but it is beneficial.

The stomach must be relieved of all work. To this end, no food should be given by the mouth, and rectal alimentation must be substituted. For this purpose, there should be administered by the rectum three times daily a mixture consisting of eight ounces of milk, one egg, and a salt-spoonful of salt. Attention should, of course, be given to all the technical details involved in rectal alimentation. At the end of five days, or if the patient can go without food that long, seven days—feeding by the mouth may be commenced. At first, one ounce of milk may be administered every hour for one day. The next day, two ounces may be given every two hours; on the third day, three ounces every three hours; and so on, until the patient is taking eight ounces of milk three times daily. Of course, this quantity of food is not capable of nourishing the patient satisfactorily; so it is a wise plan to supplement it by continuing the rectal feeding twice daily.

At the end of the second week of the treatment, the patient may be permitted broths and bouillon in addition to the milk, and the intervals of feeding considerably reduced. Finely divided meats, raw oysters, sweet-breads, spinach, well-cooked rice, and mashed potatoes may be permitted, in small quantities at first, gradually increasing the amount, in accordance with observations made as to their effects and the condition of the patient. It is of the greatest importance that the foods prescribed be given at a luke-warm temperature, as excessive heat and cold are deleterious.

Some authorities recommend milk by the mouth in conjunction with general rest in bed from the first. In cases in which rectal alimentation is not tolerated, one may compromise—though he should not do so—on this point.

There can be no question that gastric ulcer is dependent in part upon hyperchlorhydria. Neutralization of this condition may be well considered as a part of the treatment. Fortunately, the absolute rest given the stomach by the rigid treatment lessens the gastric secretion; hence, the hyperchlor-hydria seldom requires special treatment. Should special measures be demanded in any case, one may resort to material doses of Bicarbonate of Soda

or Calcined Magnesia. Mathieu believes that the chemical correction of the hyperacidity constitutes an efficient treatment of itself, and to this end recommends the administration of alkalies in all cases.

For the relief of pain, Phosphate of Codeia in doses of one half-grain may be prescribed. As a rule, however, the complete rest and the abstinence from food, make this course unnecessary. Bicarbonate of Soda and Calcined Magnesia are also efficient palliatives of the pain.

Measures necessitating the use of the stomach tube should not be countenanced under any circumstances.

As a rule, but little trouble is experienced from vomiting during the course of the "rest-treatment for ulcer." Should it become annoying, relief may be obtained by the administration of small pieces of ice, or sipping of small quantities of champagne, or hot applications to the epigastrium. Morphia will subdue the gastric irritability in severe cases. When all measures fail, Goodno recommends the light application of the actual cautery to the epigastrium.

The remedies most frequently indicated in the treatment of ulcer of the stomach, include *Argentum nitricum*, *Uranium nitrate*, *Phosphorus*, *Arsenicum*, *Kali bichromicum*, *Mercurius corrosivus*, *Hydrastis*, *Bismuth*, and *Atropia*.

*Argentum nitricum* is a favorite remedy among physicians of both schools of medicine. The presence of gastric irritability, as evidenced by severe pain aggravated by the taking of food, is a valuable indication. It may be administered in the 2x or 3x trituration. Among old-school physicians, it is prescribed in pills of one-fourth of a grain each, three to four times daily. Its beneficial action is explained by its local stimulating effect.

*Arsenicum album* in its pathogenesis, presents strong symptomatic resemblances to the clinical phenomena of gastric ulcer. These symptoms are the violent burning pains, epigastric distress and tenderness, vomiting of blood, and thirst. Like Argentum nitricum, it is indicated when there is well-marked gastric irritability.

*Phosphorus* presents the characteristic pain and vomiting; but the special indication for its administration is the relief effected by the taking of cold water.

*Kali bichromicum* and *Mercurius corrosivus* have been recommended in the treatment of gastric ulcer on general principles, owing to their known ability to produce ulcerations. The former drug has in its symptomatology the characteristic localized sensitiveness observed in cases of gastric ulcer.

*Uranium nitrate* is a favorite remedy with certain English practitioners, notably Drysdale and Blake.

*Hydrastis* is indicated in cases in which symptoms suggestive of a generalized catarrh of the gastric mucous membrane are present. It should be given in the tincture or fluid extract.

*Atropia* is a valuable remedy in cases attended by marked gastralgic paroxysms. It also acts by physiological antagonism to lessen the hydrochloric acid secretion. It may be given in the 3x trituration, one tablet every two hours, or $\frac{1}{200}$ of a grain three times daily.

The supervention of perforation calls for surgical treatment, which must be instituted with the greatest despatch, if favorable results are to be attained.

**The Lenhartz Treatment of Gastric Ulcer.***—As satisfactory as is the rest treatment of gastric ulcer, there are many cases in which it has proven futile. In 1901, Prof. Lenhartz suggested a concentrated egg-albumen diet as a more rational method of treatment. His suggestion was based upon the theory that gastric ulcer is perpetuated by the associated hyperchlorhydria, and that egg-albumen is the most efficient food that will bind the free hydrochloric acid and neutralize the hyperacidity. The following is the tabulated management at the Eppendorfer Krankenhaus, as outlined by Haberman, of Hamburg :

Absolute rest in bed for at least four weeks. All mental excitement to be avoided. An ice-bag is placed upon the stomach, and kept there continuously for two weeks. This prevents gaseous distention, prompts contraction of the gastric walls, thus tending to obviate hæmorrhage, and eases the pain when present. On the first day, even where a hæmatemesis has occurred, the patient receives between 200 and 300 cc. of iced milk, given in spoonfuls, and two to four beaten eggs. At the same time Bismuth subnitrate is given twice or thrice daily, 20 grm. at a dose, and is continued for ten days. The eggs are beaten up entire (with a little sugar) and the cup containing them is placed in a dish filled with ice, so that they remain cold. Sometimes a little wine is added. This food at once binds the supersecreted acid, and therefore mitigates the pain rapidly and causes the vomiting, often quite troublesome, to cease. The allowance of milk is increased 100 cc. daily, and at the same time, one additional egg is given so that at the end of the first week the patient is taking 800 cc. of milk and six to eight eggs. Both these foods are now continued in the same amount per day for another week. No more than one litre of milk a day is allowed at any time.

" Besides milk and eggs, some raw chopped meat is given from the fourth to the eighth day on, usually the sixth ; 35 grm. per day in small divided doses (easily stirred up with the eggs or given alone), the day after 70 grm., and later possibly more if well digested. The patient is now able to take some rice or greisbrei, well cooked and a little zwiebach (softened). In the third week, quite a mixed diet is tolerated, the meat now being given well cooked or lightly broiled. All heavy foods are, of course, interdicted as well as vegetables with husks, etc., and those tending to produce flatu-

* *Medical Record*, June 16, 1906.

lence. At the same time the patient is given orders to masticate his food thoroughly."

In a series of 135 cases treated by the Lenhartz method, recurrence was noted in but 8 per cent. of the cases, and but three deaths. The majority of cases were dismissed as cured before the eighth week. A method of treatment giving such results is worthy of serious professional consideration.

## Remarks on the Surgical Treatment of Ulcer of the Stomach.

By W. B. Van Lennep, A.M., M.D., Professor of Surgery in the Hahnemann Medical College of Philadelphia.

First, it should be said that by no means all ulcers call for operative intervention. The acute form, for example, probably anæmic in origin, and met with in young, chlorotic females, tends to spontaneous cure under appropriate treatment, and only exceptionally do perforation or hæmorrhage require such operation as will be shortly described.

The chronic variety, the ulcer thought to be dependent upon hyperchlorhydria or mechanical injury to the *grinding* portion, is the one that particularly interests us. It usually assumes this character from the beginning, although it may follow the subsidence of the acute form and may develop active exacerbations. One point in particular should be borne in mind, *i. e.*, that chronic ulcer is liable to deceptive ameliorations, with or even without treatment, and patients should therefore be observed over considerable periods of time before being assured of a cure. In a most excellent *resumé* of the subject of gastric ulcer, Bartlett* states that if the symptoms persist after eight weeks of local and general rest, carried out as he describes in detail, the surgeon should be called in. This is safe advice so long as the case is under the care of the one physician and for the initial manifestations, but such patients are prone to roam from one to another, so that the relapses cannot be compared, and, besides, each aggravation increases the danger of fatal or crippling complications. For these reasons many believe that this time-limit should be cut down by one-half and such treatment only instituted in the absence of obstruction or distortion.

Aside from this, the severity of the pain—the gastralgia—the degree of the dyspepsia and the location of the ulcer are valuable guides. Thus, pain to the back and in the supine position, relieved by leaning forward or on standing, suggest ulcer of the posterior surface; while superficial, distinctly outlined tenderness, with the reverse results from posture, point to the anterior surface. The prognostic value of such observations will be referred to directly.

The urgent indications for operation are hæmorrhage and perforation.

* *Hahnemannian Monthly*, September, 1903.

Hæmorrhage from chronic ulcer is the form usually calling for surgical intervention, and then when the bleeding recurs after a short interval, usually with an aggravation of the gastric symptoms as a prodrome, and threatens the patient's life. Like genito-urinary stone and pulmonary tuberculosis, all gastric ulcers probably bleed at some time during their course; often almost imperceptibly; again, in moderate quantity and at long intervals; exceptionally, fulminating and carrying off the patient before any aid can be given. Although it is often hard to decide just how long and how profusely a patient should be allowed to bleed, and although opinions differ as to whether one or two recurrences should be awaited, there seems to be no doubt as to the indicated remedy, *i. e.*, to splint the stomach by gastro-enterostomy, which will stop the hæmorrhage and allow the ulcer to heal.

Perforations will vary considerably in their results. On the anterior surface they are apt to be acute, sudden in their onset, producing more or less extensive extravasation, with the consequent, familiar symptoms of peritonism. In the so-called sub-acute form, there is the same sudden onset, but protective adhesions have time to plug the vent; the stomach is not so full, probably, or its contents not as septic. As a matter of fact, the normal, acid gastric fluids are more or less sterile and it is easy to make them completely so by cleansing the mouth, by lavage and the ingestion of aseptic fluids. Not so, however, with the stagnating contents of a dilated, obstructed stomach; tetany of varying severity is probably a somewhat common result and may be aggravated to a fatal degree by promoting absorption through washing, or by suddenly dumping the putrefying material into the small intestine through an anastomosis. Ulcer of the duodenum seems particularly prone to perforation, although the extravasation is often walled off; if not, the escaping fluids are apt to run down the lateral gutter and simulate acute appendicitis. The paroxysms of pain associated with these ulcers not infrequently mimic gall-stone disease quite closely, their delayed onset after eating and the absence of hæmatemesis throwing the attendant off his guard.

The treatment of acute and sub-acute perforation is, briefly, abdominal section, closure and inversion of the rent when found, or exposed if covered, a careful hunt for other openings, as ulcers are often multiple and on opposite surfaces, peritoneal toilet with supra-pubic or other drainage, as deemed best, and gastro-enterostomy if the suture has produced a constriction, or if other active ulcers are recognized or *suspected.* Chronic perforation is especially met with on the posterior surface and produces either a peri-gastritis with resulting adhesions to neighboring organs or the parietes, disturbing motility and distorting the stomach, or a fibrino-purulent peritonitis, an abscess in other words, which may become subphrenic (the *pyo-pneumothorax subphrenicus* of Leyden), may empty into neighboring organs or on the surface. The appropriate treatment would be evacuation and gas-

trolysis, with closure of any exposed openings, but the danger of the adhesions reforming not infrequently calls for one of the anastomotic measures to improve drainage.

The non-malignant stenoses, either intrinsic in origin or from the adhesions just referred to, have led to a great deal of very interesting work. Without taking time to detail the plastic measures for the relief of the bifid, trifid or otherwise distorted stomach,* the far more common stricture at the outlet is treated by enlarging the same, or by drainage from the most

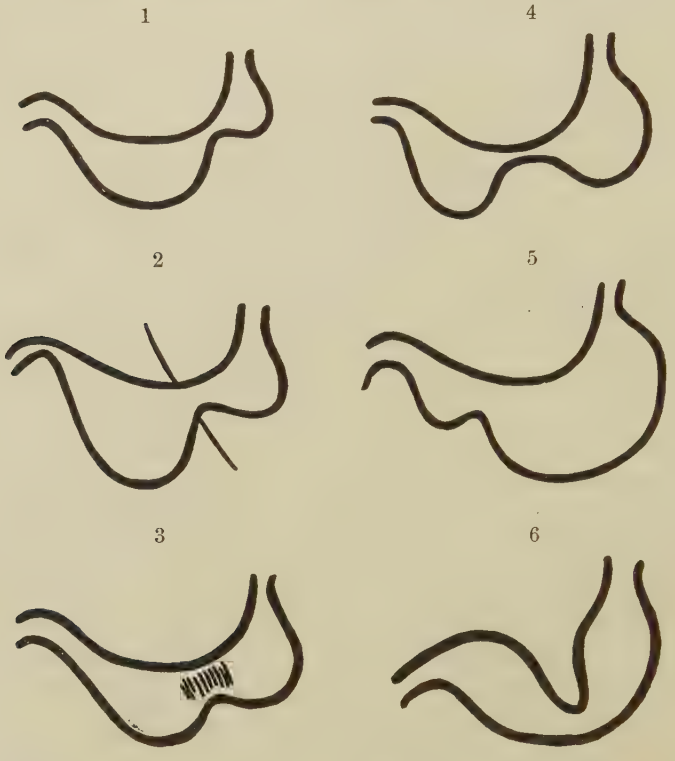


FIG. 6.—(Moynihan.) Types of hour-glass stomach: 1, Obstruction near cardiac end; 2, cardiac pouch concealed by adhesions; 3, growth in body of stomach; 4, two pouches connected by a narrow tube; 5, cardiac pouch largely dilated; 6, lesser curvature pulled down toward the greater.

dependent point. In this class should be included the spasm and consequent hypertrophy of the pylorus, which is quite a constant concomitant of ulcer and which, through the resulting fibroid changes, really amounts to a stricture. The familiar procedure of Heineke-Miculicz has given way to a wide anastomosis between the stomach and duodenum, a gastro-pylo-duo-

* "Hour-glass" stomach and the operative principles for its correction can be readily understood by glancing at Figs. 1 and 2 from Moynihan's brochure on *The Surgical Treatment of Gastric and Duodenal Ulcers*, kindly loaned by the publishers, William B. Saunders & Co.

denostomy, by an inverted U-shaped incision devised by Finney. Aside from a free opening, with less danger of subsequent contraction, the level of the pylorus is lowered and evacuation facilitated. Kocher's anastomosis between the stomach and duodenum (a gastro-duodenostomy) accomplishes practically the same result, except that the pylorus is eliminated and the opening is of necessity smaller.

In the presence of extensive, pyloric adhesions, when Kocher's method may still be used, or especially of active ulceration, it appears better to

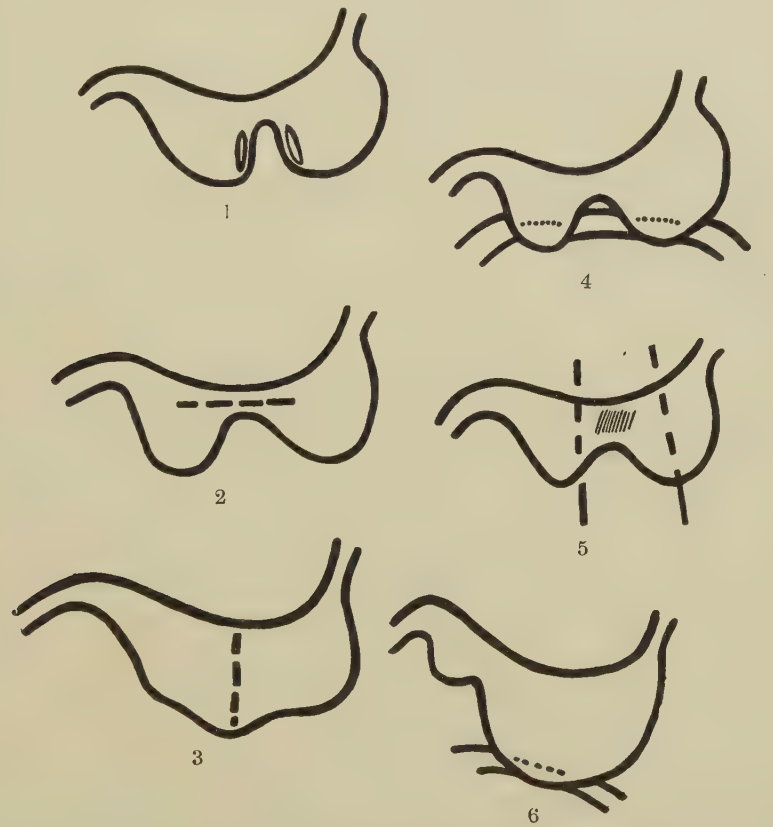


FIG. 7.—(Moynihan.) Diagram showing the operations for hour-glass stomach; 1, Gastro-gastrostomy; 2 and 3, gastroplasty; 4, double gastro-enterostomy; 5, partial gastrectomy; 6, gastro-enterostomy from the cardiac pouch.

divert the stream and give the stomach dependent drainage, so that gastro-jejunostomy has become deservedly popular and is best performed posteriorly, after the original method of von Hacker, by an unsupported suture, as in Abbé's lateral anastomosis.

The occurrence of peptic ulcer in the jejunum close to the anastomosis, like the ulcers met with in the duodenum, appears to be dependent upon the action of the acid gastric secretions, increased as they are by the pres-

ence of ulceration. It may prove to be true, as claimed by Roux, that in an anastomosis close to the origin of the jejunum, the biliary and pancreatic fluids will be able to neutralize this hyperacidity.

As to the permanence of the anastomotic opening, Nature's rule concerning fistulæ seems to hold good, for this will persist in the presence of pyloric obstruction, while it will invariably contract, whether large or small, in its absence.

Compared with the gastro-duodenostomies of Kocher and Finney, the latter, though ideal, do not so far appear to have the same healing effect upon active ulceration; the stomach may not be as completely "splinted," for they do not stop bleeding, and the ulcer-bearing area has to be traversed by the food. While they may drain then, they do not as completely divert.

Excision of the ulcer-zone as suggested by Rodman is radical, precludes the possibility of cancer-grafting on an ulcer-base (the ulcus carcinomatosum) and by the simplified technique appears perfectly feasible. Whether we can dispense with the "grind-stones," scarred although they be, remains to be seen.

## Carcinoma of the Stomach.

In the present state of medical and surgical science, the only curative treatment of carcinoma of the stomach is surgical intervention. Unfortunately, most cases come under the care of the physician at a time when they have passed beyond the pale of surgery, excepting for one of the palliative operations. Still others seek medical advice early enough, but in our efforts to make the diagnosis absolutely certain—which can never be the case until we feel the tumor—we lose valuable time, and palliative medical treatment is our only recourse. The indications for surgical treatment of carcinoma of the stomach will be discussed at the close of this section by Dr. Van Lennep.

When circumstances are such that the medical man only can treat the case, we must realize that our efforts must consist of making the patient as comfortable as possible and endeavoring to prolong his life. To this end, the special measures employed include the alleviation of symptoms and the maintenance of nutrition. The latter—the maintenance of nutrition—involves the question of diet. It stands to reason that the time must come, and that too early in the course of the disease, when it is manifestly impossible to have the patient digest and assimilate sufficient food to make up for the great waste. It is, therefore, the height of folly to force upon him large quantities of food which cannot be managed by his digestive organs. Theoretically, the absence or deficiency of hydrochloric acid from the gastric secretion suggests that foods requiring the aid of this substance, as those of animal origin, should be eliminated from the diet. Practically,

this is not altogether the case, for if the patient is limited too much in the selection of his diet, general nutrition and strength suffer. It is important that he be fed as generously as possible under the conditions existing. Trousseau years ago formulated the rule that patients with gastric carcinoma should be permitted to select that which best agrees with them, and this is a good working rule as long as there is a reasonably good appetite. In the early stages of the disease, the symptoms and conditions are such as we find in gastric catarrh, the only exception being the presence of a lesion tending to increase rapidly in response to any local irritation. In the beginning, we should administer easily digested mixed diet. The animal food should be followed in about half an hour by a dose of dilute hydrochloric acid. Milk may be given predigested (peptonized), or one of the fermented preparations, as koumyss, matzoon, etc., may be prescribed. Meats should be finely divided before swallowing. When fats do not disagree, bread and butter constitute an important part of the diet. Special articles which are generally found to be easily borne, include eggs, poultry, oysters, fish, squab, sweetbreads, crackers, tea, and coffee. In the later stages of the disease, as a rule, nothing but artificial foods agree. We may then use the various peptones and good beef-extracts, somatose, and panopeptone, supplemented by rectal alimentation. The latter procedure should not be deferred until forced to it as a last resort. Adopted moderately early in the course of the disease, it is invaluable in maintaining nutrition and prolonging life in comparative comfort.

The symptoms which especially call for palliation are the pain and the vomiting. The pain is best treated by preparations of Opium. When Morphia does not produce constipation, it will prove the most satisfactory analgesic. Unfortunately, it too often disturbs the action of the bowels. Then we must have recourse to *Phosphate of Codeia* in doses of one-half grain, or *Svapnia*, in doses of one grain. Their frequency of administration must be gauged by their physiological effects on the patient. As the case progresses, however, larger and larger doses of these drugs will be required, not only because of the intensity of the pain which they are designed to relieve, but also because the patient becomes habituated to their use. Chemically pure *Methylene blue* (medicinal) will be found at times to act as an analgesic. Sometimes, it does even more than this, stopping, as it may, the progress of the lesion and keeping it in abeyance for many months. It should be given in capsule in three grain doses, which may be repeated once or twice daily. It cannot be prescribed with any satisfaction in cases in which vomiting is persistent or frequent, because of the ability it has of staining everything with which it comes in contact. With some persons, it produces quite severe urinary irritation. This latter symptom may be obviated by giving the Methylene blue in combination with powdered nutmeg (*Myristica*).

For the relief of the vomiting, there is nothing like lavage, for it not infrequently controls this symptom entirely after the first seance, even in cases in which the vomiting has been almost incessant. It is necessary, however, that it be practiced day after day, as long as the patient's strength will permit. It must, moreover, be thorough and the sitting continued until the return flow of water is perfectly clear. It will aid the patient's general nutrition if each washing is followed by the introduction of a generous allowance of some nutritious easily assimilable liquid food, *e. g.*, a pint of warm peptonized milk. Sometimes the administration of iced champagne or small pieces of ice will relieve the vomiting, thus obviating the necessity of using the tube. The tube is always contra-indicated in cases in which there is vomiting of blood.

Constipation must be prevented as far as possible, for it serves to increase the distress arising from the gastric lesions. If possible, it should be controlled by enemata.

The internal remedies advised in the treatment of cancer rarely have any specific influence over the primary disorder, if we except Methylene blue, Carbolic acid, and Arsenic. *Hydrastis*, for example, which has really done considerable for this disease, owes its efficiency to its control over the associated gastric catarrh.

*Arsenicum* is a standby of both schools in the treatment of malignant disease in any situation. It should be given in tablets of the 2x trituration, repeated every three hours. The special indications for its employment include frequent vomiting, burning lancinating pains, and the general cachexia. Its use must be persisted in over a prolonged period if good results are to be attained.

*Phosphorus* has been highly praised as a remedy for cases similar to those calling for Arsenic. The special symptoms indicating it are the "coffee-ground vomit," the burning pains, and the aggravation from the drinking of cold water. I must confess my lack of faith in it.

*Carbolic acid* and *Creosote*, so far as I can learn, owe their use in this disease to pure empiricism. They rarely exert any specific influence over the growth of the tumor, although Goodno reports one case in which Carbolic acid in the 1x dilution controlled the hæmorrhage, and greatly improved the general health, prolonging life for three years. The autopsy showed an atrophic scirrhus of the lesser curvature of the stomach. Both Carbolic acid and Creosote are indicated by persistent vomiting, the latter remedy having the symptom more prominently.

*Condurango* was introduced a number of years ago as a specific in cancer of the stomach. Its failure to do the impossible has led to its abandonment, and yet it is capable of doing much for the patient. It aids digestion, improves the appetite, and makes the patient more comfortable. It should be given in the form of infusion or fluid extract. Of the former,

prepared in the proportion of one ounce of the bark in one pint of water, half a wine-glassful should be administered before meals. Of the fluid extract twenty minims to one drachm is the proper dose.

The asthenia of the later stages calls for the use of Alcohol in some of its forms.

## The Surgical Treatment of Carcinoma of the Stomach.

By Wm. B. Van Lennep, A.M., M.D., Professor of Surgery in the Hahnemann Medical College of Philadelphia.

The surgical treatment of gastric cancer represents the culmination of the work upon the stomach, and when we realize that this organ is the most frequent seat of such growths, the importance of the subject must impress every one. With an accurate anatomical knowledge and a simplified, rational, operative technique, we are practically in the same position as in uterine and breast carcinoma, *i. e.*, success depends upon early operation. Considering the universal mortality of the disease, if left alone, and the prohibitive death-rate if operated too late, exploratory incision is the only reliable diagnostic resource, and it is our duty to educate the public to resort to this when the clinical signs point to cancer or even lead to a reasonable suspicion of its presence. Such an incision has been aptly termed by Mayo-Robson "the minor abdominal section," and permits of digital and even ocular exploration. In the presence of inoperable disease, the opening can be firmly closed by a non-absorbable suture to avoid the bed-confinement which so often precipitates the end.

Given a patient of the cancer age who from unknown cause loses appetite and flesh and suffers from an indigestion which does not promptly yield to treatment, and a reasonable suspicion is established. Given, again, a patient of the proper age who apparently relapses after one or more attacks of gastric ulcer, and the possibility of cancerous implantation should again arouse the observing clinician. The geography of ulcer and cancer are the same, and the sequence is sufficiently frequent to be of suggestive value. As, fortunately, three-fourths of gastric cancers are in the neighborhood of the pylorus, one of the earliest symptoms to attract attention will be disturbance of gastric mobility and stomach dilatation. Add to these the history of previous ulcer, perhaps, and the general symptoms above mentioned, together with the appropriate age, and the suspicion closely approaches conviction. I have purposely referred to clinical observation and have omitted mention of laboratory findings, chemical and microscopic; for while in a general way excess of hydrochloric acid stands for ulcer, and a low value of the same suggests cancer, as far as successful surgery is concerned, they have been shown to be of use only when the case is hopeless.

Many think that to diagnose gastric cancer a tumor must be felt, and

years ago we learned the dictum that the recognition of a tumor precluded operation. If such a tumor be immovable, if it involve the body of the stomach, if jaundice and ascites be present, with enlargement of the liver, or hepatic and even supra-clavicular nodes, then, of course, it is true. But a small pyloric tumor may sag into view, so to speak, and not only give us a good operative prognosis, but also be *almost* pathognomonic. Almost pathognomonic because inflammatory thickening around an ulcer may produce a tumor which often cannot be distinguished from cancer even after the abdomen is opened, except that it is less hard and nodular. Such a tumor, too, may be associated with enlarged lymphatics, which closely resemble those infiltrated by malignant disease. It is these so-called "sentinel" nodes, by the way, that sometimes serve as guides to a round or fissured ulcer which cannot be felt or seen on the stomach surface. Occasionally, cancerous or chronic inflammatory enlargements of the head of the pancreas will produce a somewhat similar tumor, but it will be less movable and sooner or later associated with jaundice and an enlarged gall-bladder, as well as disturbances of the digestive and, at times, the metabolic functions of the pancreas.

In cancer of the breast successful extirpation has followed the recognition, first, of skin infiltration, and, second, of the various lymph-streams leading from the organ. In like manner we find mural infiltration, in the far commoner pyloric growths, spreading toward the dome and but slightly toward the duodenum, and the freedom of excision varies accordingly. A study of the lymph-stream, too, has completly changed the method of attack since the time when Billroth practically declared it hopeless. The lymphatics perforate the wall and early infect the nodes along the lesser curvature, which much be removed in its entirety. The glands, like the vessels, along the greater curvature, are set at a distance from the stomach wall to allow of dilatation from food, and the direction of the stream is largely from left to right; this permits sparing the dome and this curvature, facilitates anastomosis or union of the defect and leaves the remnant of an organ which has or soon attains a considerable capacity. Enlarged nodes to the left of the line of excision can be readily teased out, just as the axilla is cleaned after giving a breast growth a liberal berth.

Again, as in hysterectomy, the operation is rendered bloodless by securing four principal vessels, so, in the stomach, the gastric artery is tied at one end of the lesser curvature and the pyloric at the other; going through the gastro-hepatic omentum, the pylorus is freed and raised to avoid the middle colic, just as we fight shy of the ureter, and the right gastro-epiploic or its parent vessel is caught; finally, its fellow on the left side is secured at an appropriate point and the hæmostasis is complete. Doubly clamping the duodenum close to the seat of disease and the stomach well away from it, excision is quickly carried out with the thermo-

cautery, all sources of infection being seared; or the same can be done with knife or scissors and an occluding suture introduced behind one or both clamps, before their removal. The seared or crushed edges are then trimmed off, and turned in. If both openings are closed, the obliterated stream is restored by a posterior gastro-jejunostomy, and if a spur result the loop is best twisted, this being supplemented by entero-enterostomy and occlusion by infolding. If the defect is not too great and the theoretically ideal, duodenal implanation decided on, the stomach end is treated as just described, and the divided duodenum is implanted into its posterior wall away from the line of suture, leakage being much less likely than in the old Billroth-Wölffler method of pylorectomy, in which the stomach opening was sutured down to equal the lumen of the duodenum. The abdomen is finally closed, with or without drainage, in such manner as the operator may prefer. I have found, like many others, that the entire operation can be done within the hour and with a safety dependent almost entirely upon the absence of metastases and attachment to other organs. While different surgeons vary the procedure just described in certain details, and while the perfected technique represents the combined work of such men as Robson and Moynihan, Hartman, Doyen, von Eiselsberg, Witzel, Kocher, Czerny, Murphy and Billroth's pupil, Miculicz, the credit at least for placing the operative surgery of stomach cancer upon a basis of practical results is due to the Mayo brothers.

## Chronic Catarrhal Gastritis.

The complex problems involved in the etiology of chronic catarrhal gastritis, make the treatment of this affection a severe test of the skill of the practitioner. Especially does this remark apply to the so-called secondary gastritis, in which other organs than the stomach are primarily at fault. The hygienic measures demanding attention include:

(*a*) The correction of bad eating habits.
(*b*) The regulation of the diet.
(*c*) A proper balance of rest and exercise.
(*d*) Fresh air.
(*e*) Bathing.
(*f*) Lavage.
(*g*) Regulation of the bowels.
(*h*) Electricity.
(*i*) The relief of special symptoms.
(*j*) Attention to organs primarily affected in secondary gastritis.
(*k*) Proper medication.

(*a*) **The Correction of Bad Eating Habits.**—This constitutes the first duty in the directions given the patient with chronic gastric catarrh. To secure this end, a most searching inquiry must be made into his past

history, especially with a view of determining his practices as to manner of eating, including, under this head, the rapidity of eating, the thoroughness of mastication, the daily quantity taken, the times of meals, the character of the food, and the extent of indulgence in alcohol and tobacco.

Patients may eat rapidly, and yet masticate food with a fair degree of thoroughness, though this is not usually the case. Mechanically, rapid eating is pernicious because it throws a quantity of food into the stomach too suddenly, *i. e.*, before the secretions of the organ have made it ready for the reception of alimentary substances. Food also enters the stomach before it has had a thorough admixture of the saliva and the starchy constituents acted upon by that digestive fluid.

Imperfect mastication throws increased labor on the stomach, because food is not sufficiently comminuted for favorable action of the gastric juice. In the beginning this pernicious habit of eating is due to definite causes; when long-continued, it becomes "second nature" to the individual. The causes leading up to it include defective teeth, anxiety to get away from the table in order to attend to other matters, and a natural tendency observed in some individuals "to rush everything." As the Germans say, "As a man eats, so he works." To correct the habit when once formed, a strong effort of the will is required. In fact, the patient will find himself obliged to keep his mind strictly on his manner of masticating it, until proper methods have been established as a habit. Conducive to this end, are pleasant surroundings and congenial companionship at meals. The habit can never be corrected, however, unless the teeth are in perfect condition; so the attention of the dentist must be a preliminary of the treatment.

Excessive indulgence in the pleasures of the table is a cause not always readily discovered, because it is not usually admitted by patients. The actual quantity of food required each day cannot be fixed arbitrarily, but one can judge pretty accurately of how far the patient is running into excess if he obtains from the patient a written statement covering his indulgences at meals over several days. Such a list will, moreover, give information as to whether the patient is taking too great a variety of foods, whether he is indulging too freely in sweets, pastry, iced drinks, and alcoholic liquors.

Regularity of eating is a pre-requisite of success. The stomach like all organs forms habits. There comes a craving for food at special intervals. To permit that organ to go empty for an undue interval one day, and to crowd the hours of meals close together the next, cannot but act deleteriously. Irregularity in eating is conducive to other bad habits, especially to rapid eating and imperfect mastication.

Alcohol and tobacco are among the direct causes of chronic catarrhal gastritis. Their use must positively be interdicted in toto in all cases in which they have played a part in the etiology of the case in hand. It may even be said that probably all cases of this disease will do better if their use is abandoned, at least for a time.

(*b*) **Regulation of the Diet.**—In the mild cases attention to the details above suggested may suffice without any additional regulation of diet. In those of moderate severity, some slight restrictions as to foods especially deleterious, or prepared in a way to make them indigestible, will, in conjunction with other hygienic measures, be sufficient to work a cure. In the most severe examples of the disease, one must begin with the lightest of foods, and as the patient improves, add article after article to the diet list, until a full diet is reached.

As previously stated, the author is firm in his conviction that improper preparation of foods is responsible for much of the dyspepsia that pervades city and country alike. If the reader doubts this assertion, let him dine unexpectedly—take "pot-luck" as it is commonly called—with some of his dyspeptic families. Heavy bread, fried foods swimming in fat, the most peculiar sequence of dishes, etc., will not unlikely be placed before him. As regards the matter of sequence of dishes, it is well known that one can indulge in a remarkably large quantity of foods at a well-organized banquet, and yet suffer but little in consequence. The reason for this is two-fold. In the first place, the mind is relaxed, and the good fellowship promotes digestion and appetite; and in the second place, caterers have learned by experience, the results of which are borne out by physiological considerations, that a certain sequence of food-stuffs is conducive to the stomach's welfare.

In cases of gastric catarrh of moderate severity it is the best plan after finding out what the patient has been in the habit of eating, to forbid those which may be regarded as harmful. This is certainly far better than naming a limited list of foods which are permissible.

The articles which should be forbidden include the following: Rich soups, fried foods, hot and too fresh bread, pastry of all kinds, including griddle cakes and waffles, veal, pork, kidneys, hashes, stews and all twice-cooked meats, preserved meats, as corned beef, salt mackerel, dried beef, potted meats, goose, duck, sausage, scrapple, sardines, lobsters, crabs, food rich in cellulose, as cabbage, cauliflower, celery, radishes, and carrots; cucumbers, egg-plant, turnips, sweet potatoes, squash, oyster-plant, nuts, preserved fruits, tea, malt-liquors, and, excepting when indicated, brandy and whisky. Long though this list is, it nevertheless leaves a much longer one from which the patient may choose with safety.

In the severe cases, one has before him a most difficult problem. He is face to face with a patient whose nutrition is far below the normal, and yet the stomach will not tolerate sufficient food to bring repair to an equality with waste, to say nothing of restoring what has been lost by the months of illness. The first indication is the restoration of the digestive capacity of the stomach. To this end, we give that organ a short period of rest. The patient is already so starved that a few weeks more of

scanty regimen will not make matters any worse. So we start the case on an exclusive milk diet. It may even be that the stomach cannot tolerate ordinary milk, in which case we must have recourse to peptonized milk, koumyss, matzoon, milk mixed with lime water, etc. If the milk alone is tiresome, we may order in addition some light broth or gruel. After about two weeks, we may add solid food to the diet list. Here we begin with the lightest possible foods, as bread and butter, raw oysters, oyster soup without the oysters, boiled rice, broiled chicken, sweetbreads, broiled squab, soft-boiled eggs, baked potatoes (providing flatulence has ceased), and broiled fish. One must proceed slowly in advising additional articles, and be satisfied that what has been taken agrees with the patient before the list is extended. The patient will undoubtedly grow weaker during the early days of the treatment while on a milk diet, especially if he is permitted to go about. It is, therefore, necessary to supplement the strict dietetic regimen by rest in bed. Throughout the course of the treatment, a regulation as to quantity is of the highest importance. Above everything else, the stomach must not be overloaded. If sufficient food to satisfy the demands of nutrition is not well borne, then we must feed at comparatively short intervals.

(*e*) and (*d*). **A Proper Balance of Rest and Exercise and Fresh Air.**—Before deciding as to whether the patient shall rest more or take plenty of exercise, one must decide two points. One is the previous habits of the patient as to physical activity, and the other whether he is losing or gaining weight. It is too commonly the practice to recommend all dyspeptics indiscriminately to exercise in the open air or gymnasium in a most general way, giving no specific directions whatever as to methods, etc. If the patient is not much under weight, and if his previous habits have been of a confining or sedentary character, then exercise is proper, but it must be pleasurable, it must be conducted in the open air, and it must never be pushed to the point of exhaustion. The objection that such exercising takes time should count for nothing, for his health is cheap at any price. Matters can nearly always be arranged in such a way that the man of business can steal away twice a week for a few hours of out-door pleasure; or he may change his business routine in a way to conform to the order of things desired by his physician. At once, I am asked what shall be done with the underpaid clerk, the hard-working farmer, the laboring man, and other wage-earners. The conditions surrounding these toilers do not invalidate my remarks in the least. The laboring man and the farmer do not need the exercise; their previous habits have not been sedentary. With the farmer, the difficulties to be corrected nearly always lie in the direction of the removal of gross dietetic errors, including eating while overheated, and the taking of badly cooked food, and rushing to work too soon after a meal. The laboring man probably has a bad atmosphere to

contend against, and this cannot be regulated as long as he continues his present employment. But he does not need physical activity. When he is sufficiently ill to make his case subject to the rules I have inculcated, he is too sick to follow a laborious occupation, and is ready to give up and submit to the life which will bring him health and restore his wage-earning capacity. The under-paid clerk probably offers the greatest problem, for his hours are long, his occupation sedentary, and the air he breathes polluted. We can only advise him to do the best he can under the circumstances, which usually means the making the best of his Sundays and his Saturday half-holidays, riding on a bicycle or walking to and from his place of business, and short calisthenic exercises in his room on rising in the morning. All classes should have their regular vacations, during which time much may be done, if the time is spent profitably, to fit themselves for the working days of the year.

The objections the writer has against exercising in a gymnasium are based upon the treadmill-like character of the movements and their being practiced in the polluted air of a room occupied by many persons, most of them sweating profusely. The out-door exercises to be commended include walking with a congenial companion, horse-back riding, golf, bicycling, tennis, and games generally. Gunning and fishing will likewise appeal to many.

When the patient is losing weight, exercise is inadmissible. Then we must prescribe rest. The extent of this rest will vary quite considerably. The severe cases, which we put on a milk diet at the beginning of the treatment, require to be sent to bed. Cases of moderate severity need to be restricted only as to exercise for half an hour after meals or after the heartiest meal of the day.

As to fresh air, the more of it obtained by the dyspeptic, whether he be seriously or but slightly sick, the better it is for him.

(*e*) **Bathing.**—A clean skin promotes action of that organ and this in turn has a favorable influence over the mucous membranes generally. In addition to this a cold sponge bath followed by energetic friction to promote reaction each morning will greatly improve the general tone of the patient.

(*f*) **Lavage.**—Thorough washing of the stomach finds in chronic gastric catarrh a malady which responds wonderfully well to its influence. The favorable action is exerted by reason of the removal of mucus and fermenting materials from the stomach, thus permitting of the readier contact of the gastric secretions with the ingesta. The free drinking of water is a poor substitute, for it only serves to wash into the intestines substances which are better out of the body than in it, unless it so happens that the stomach is known to be empty after a night's rest, in which case a glass of hot water, slowly sipped, is perfectly proper, if not actually beneficial.

It is not always an easy matter to remove adherent mucus from the gastric walls. When the case does not progress as favorably as expected, the water should be made to run into the stomach under high pressure, and should have dissolved in it one tablespoonful of salt and two tablespoonfuls of sodium bicarbonate to the quart. The washings should be repeated daily until improvement is well advanced; after which twice or thrice weekly will suffice. It is not a wise practice to relegate the use of the tube to the patient or his friends when treating chronic gastric catarrh, because the skilled eye of the physician is necessary to study the progress of the case as seen in the "wash-water."

(*g*) **Regulation of the Bowels.**—Daily action of the bowels must be secured. Hygienic measures to be described in the next chapter should find first place in bringing this about. Purgatives must not be regarded as good remedies, for they only serve to hurry decomposing masses into the intestines and they increase the gastric irritation. Moreover, they do no permanent good. In case of an emergency a bowel movement should be secured by a full enema in preference to any other method.

(*h*) **Electricity.**—Intragastric faradization and galvanization will be found efficacious in cases attended by defective motor and secretory functions. Percutaneous applications from epigastrium to back are also useful, though to a much less degree than the intragastric applications.

(*i*) **The Relief of Special Symptoms.**—In cases progressing favorably under treatment, it is rarely necessary to institute special measures for the relief of individual symptoms. In incurable or unusually protracted cases, it may be found advisable to pay special attention to certain prominent symptoms, as follows:

*For the loss of appetite*, Orexine, dilute Hydrochloric acid, Nux vomica 1x, Condurango, and Strychnia.

*For the acid eructations*, Calcined Magnesia or Bicarbonate of Soda (as palliatives).

*For epigastric pain*, hot applications, galvanism, rest, Belladonna, Arsenicum, Anacardium, Colchicum, Argentum nitricum, Lycopodium, Phosphorus, Nux vomica and Sepia.

*When gastric secretion is defective*, dilute Hydrochloric acid in five drop doses. It is a wise rule to regulate the dosage of this medicine according to the degree of deficiency as determined by gastric analysis.

*Defective motor power* should be met by electricity, lavage, and Strychnia.

*Mental depression* usually requires especial attention to regular action of the bowels.

(*j*) **Attention to Organs Primarily Diseased.**—If cases are examined thoroughly, the number of instances in which lesions of organs other than the stomach are at the foundation of the patient's sufferings is astonish-

ing. The viscera commonly at fault are the heart, lungs, and kidneys. The gastric defect associated with these is usually a passive congestion, and is rebellious to all treatment until attention is directed to the original difficulty.

(*k*) **Proper Medication.**—*Nux vomica* is indicated far more frequently than any other remedy. It is adapted to cases which have been brought on by sedentary habits, abuse of purgative medicines, addiction to alcohol, and excessive eating. The symptoms suggesting its employment include vomiting of mucus and food, empty retching, heavily-coated tongue, constipation, foul breath, and morning aggravation.

*Arsenicum album* is likewise of use in the gastric catarrh of those addicted to excessive use of alcoholic beverages. When it is indicated, the symptoms are those of local irritability, as shown by burning pains in the epigastrium, great thirst, restlessness, and vomiting. Given in doses of Fowler's solution of one drop before meals it will allay vomiting. In the Arsenicum case, the bowels incline to looseness, this being an important symptom as differentiating it from Nux vomica. The relief under Arsenic is from hot drinks and hot applications.

*Phosphorus* is indicated in advanced cases, the vomited matter showing that the gastric secretion effects very little change in the ingesta. The amelioration under this remedy is from cold drinks.

*Bryonia alba* is to be used in cases associated with disturbance of the liver and dryness of the mucous membranes of the alimentary tract. Thirst is prominent, and is attended by dryness of the mouth and white-coated tongue. Pain, when present, is described as a sensation as of a hard lump in the epigastrium. The bowels are obstinately constipated, the stools hard and dry, which state of affairs is the result of atony of gastro-intestinal tract combined with deficient secretions.

*Hydrastis canadensis* is useful in cases in which the catarrhal element is well defined. Causal indications include excessive indulgence in alcohol, and the exhaustion following acute diseases. The vomited matters are rich in mucus, and the patient complains of a sinking sensation in the epigastrium, palpitation, and constipation. The stools are not infrequently coated with mucus. This drug should be given in the tincture, the dose of which is from two to thirty drops.

*Ignatia amara* is called for on pretty much the same indications as those requiring the exhibition of Nux vomica. The distinguishing features of this medicine are the presence of marked neurotic or hysterical symptoms, and the chronic gastric catarrh of women.

*Pulsatilla* will relieve the chronic gastric catarrh resulting from addiction to rich foods, as pastry and sweets, and fats The tongue is coated ; the mouth is dry, but thirst is absent. The vomited matters consist of food, mucus and bile. The patient complains of a sensation of fulness and

heaviness in the stomach after eating; not infrequently there is a feeling as of rawness. A special symptom for which Pulsatilla is highly recommended is pyrosis associated with putrid taste in the mouth in the morning, and relieved by drinking water.

*Creosote* is indicated in cases attended by almost complete cessation of gastric digestion, as evidenced by the vomiting of unaltered food hours after eating.

*Cinchona* is called for in cases attended by great debility. The atonic condition of the stomach is displayed by the patient's craving for highly seasoned food and alcoholic liquors. Appetite is almost entirely lost. There is considerable flatulence, the accumulation of which gives rise to sensations of pressure and distention in the epigastrium.

*Kali bichromicum* is a much neglected remedy in chronic gastric catarrh. Fermentation is a prominent feature, as shown by the sour odor and taste of the vomited matters. The latter are also rich in mucus. The patient complains of distress and a "burning-rawness" in the epigastrium. The best effects of Kali bichromicum are obtained by the administration of ten drops of the 2x dilution in water half an hour before meals.

*Bismuth* in the crude form is invaluable in obstinate cases of chronic catarrh. The *Subnitrate* is to be prescribed when gastric irritability is prominent, as shown by the vomiting and the violent epigastric pains. The *Subgallate* is the better remedy when fermentation is active, and there is much flatulence. To be efficient, these remedies must be given in comparatively large doses. Usually, not less than ten grains should be given three times daily, half an hour before meals. Some cases require as much as twenty grains at a dose. When the catarrh is associated with great atony, then from ten to twenty grains of Bismuth subgallate should be administered in combination with one-thirtieth of a grain of Strychnia sulphate three times daily before meals. If obstinate constipation is an important feature, ten grains of Bismuth subgallate with two grains of solid extract of Cascara, before meals, will give great relief.

### Dilatation of the Stomach; Gastrectasia.

The treatment of dilatation of the stomach involves attention to the removal of the stagnant stomach contents, the prevention of their reaccumulation, and the removal of the primary condition.

The repeated removal of the stagnant gastric contents by lavage constitutes the most important factor in the management of this lesion. This operation must be performed daily and thoroughly for a prolonged period. Thus carried out, it is in cases unattended by mechanical obstruction oft-times curative. When the muscular tone of the stomach is peculiarly weak, and does not improve under ordinary lavage, hot and cold intragastric douching may be alternated with good effect. It is a good plan to

follow the washing invariably with the introduction of a small quantity of easily digested food through the tube.

The prevention of the reaccumulation of the stagnant gastric contents involves attention to numerous hygienic details. Food should be given in small quantities and at short intervals. Even the use of water must be restricted, not more than three pints in the twenty-four hours being permissible. In some cases, however, better progress seems to be made by feeding the patient but twice daily—morning and evening—and then, of course, giving a larger quantity of nutriment at a time. The character of the diet must be determined by the results of analysis of the test meal. If hyperchlorhydria exists, and is apparently a predisposing factor, then the dietetic and general measures to be advised when describing the treatment of that condition must be enforced. When the secretions are diminished in quality, we must endeavor to train them into activity first by the administration of easily digested foods, and, later, adding to the diet list other articles as improvement progresses. In a general way, it is a good plan to give food containing as little bulk as possible. Hence, artificial and predigested foods are of especial value. Liquids being bulky should be excluded as much as possible. The use of alcoholic beverages is inadmissible.

The tone of the muscular layer of the stomach may be greatly improved by daily use of electricty. Intragastric give much better results than do percutaneous applications.

When gastrectasia is associated with gastroptosis, the measures to be recommended for the relief of the latter condition must also be instituted.

The above measures generally suffice to greatly relieve all cases of gastrectasia unattended by organic obstruction. The latter, when present, call for surgical intervention.

The medicinal treatment of gastrectasia involves the administration of the same line of remedies as those already mentioned in the treatment of catarrh, ulcer and carcinoma. The only medicine which seems to be especially adapted to the relief and cure of dilatation of the stomach *per se* is Strychnia sulph., which should be given in doses of one-thirtieth of agrain three times daily.

### Gastroptosis.

Inasmuch as the symptoms attendant upon cases of gastroptosis are both general and local, the treatment of the condition involves attention to the patient as a whole as well as to the replacement of the stomach in its normal position and its maintenance there. Local causes are in great measure responsible for the malposition, but constitutional weakness is always an important etiological factor. This latter fact is shown by the readiness with which improvement follows a month's stay in the mountains or at the seashore with a life in the open air and freedom from the cares and

worries of business or household, and that too despite the fact that at such times the patient is apt to pay little or no attention to diet or other measures directed to the gastric condition *per se*. The first indication of treatment then is the improvement of the general constitutional tone. For this, we order that the patient *rest*. The term rest as used in the present condition is one of wide scope, including the absence of physical and mental exertion and simple change of surroundings.

The second indication for treatment is the replacement of the stomach. This is not always easy of execution, especially if the condition has existed for a prolonged period. Where the stomach once was and should be now, is occupied by other viscera. These, therefore, require attention. In women, especial attention must be paid to the manner of securing the clothing. Tight corsets must be positively forbidden. It is useless to interdict the wearing of corsets entirely, for what fashion dictates women must have. All clothing must be suspended from the shoulders ; support from the hips must not be permitted under any circumstances.

The stomach must be maintained in its normal position, and the abdominal tension raised. This indication is readily met by the adjustment and wearing of a suitable abdominal binder, which should extend to the level of the umbilicus, and exert pressure upon the abdominal contents from below upwards. No set pattern of bandage or support is adapted to all cases. Each patient must be carefully fitted, and the support adjusted to his or her particular needs. In moderately severe cases, it should be adjusted with the patient lying down or in the knee-chest posture. In those of high grade, it should be worn constantly, even when the patient is in bed.

To improve the natural supports of the stomach, certain local measures involving the use of water and electricity are required. The hydrotherapy includes mainly the intragastric spray, using alternately, for one or two minutes at a time, hot and cold water. The muscles of the abdomen and stomach may be greatly strengthened by percutaneous applications of faradism.

Systematic employment of exercises will also do much. A very simple expedient is to have the patient lie upon a blanket or rug placed upon the floor, with his arms placed by his sides, and wearing nothing but his underclothing. He then slowly raises both legs until they reach a position at right angles to his trunk. Then they are lowered as slowly as they were raised. He repeats this manœuvre ten times. A second exercise makes the legs the points of support. These parts are kept on the floor, and the patient slowly raises his body by flexing the trunk on the thighs until he is sitting upright. Then he as slowly lowers himself to the horizontal position. This manœuvre should likewise be repeated ten times. The patient may be too weak to carry out the entire procedure at his first attempt.

Under such circumstances, it is better to have shorter seances at first; increasing their duration with the improvement of strength.

The diet to be prescribed must be formulated entirely with a view of nourishing the patient. Excepting in those rare cases in which there is associated gastric catarrh, the patient should be fed liberally and often. Fat is thus deposited about the abdominal viscera, and this of itself is oftimes sufficient to give proper support to the displaced organ. To aid the digestion and assimilation of food, the patient must be ordered to rest at least for one half-hour after eating, excepting after the principal meal of the day, and then he should be obliged to rest for one full hour.

When the general strength is not sufficient to permit of exercise, then it is a good plan to order daily abdominal massage at the hands of an experienced masseur.

Most cases of gastroptosis are attended with constipation. This symptom, when present, should have close attention. If dietetic measures, as the use of figs, prunes, fruits generally, etc., will accomplish the desired end so much the better; but if they fail, then one must have recourse to mild laxatives, of which Cascara, given in doses of one to three grains of the dry extract three times daily, or four to eight ounces of Hunyadi or Apenta water in the morning on rising are the best.

Very severe cases of gastroptosis associated with marked emaciation and profound neurasthenic manifestations can be treated successfully only by resort to the full Weir Mitchell treatment, for the details of which the reader is referred to the section dealing with the treatment of neurasthenia.

Remedies adapted to gastroptosis *per se* do not exist. Those prescribed according to constitutional and local indications give the best results. Strychnia will undoubtedly improve the tone of the gastric muscularis, but it should not be given in the large doses ordinarily advised. One two-hundredth of a grain every four hours will accomplish all of which the remedy is capable. Ten grains of Subgallate of Bismuth with two grains of extract of Cascara will give great relief in cases attended by constipation and flatulence. It should be administered before meals.

### Hyperchlorhydria.

The successful treatment of hyperchlorhydria involves attention to the general habits and temperament of the patient, care as to diet, a proper balance of rest and exercise, and suitable medication. As the majority of the cases do not present the clinical manifestations of the disease at all times, it is important to determine the exact causes which produce attacks. Usually these relate to bad eating, mental worry, undue excitement, overwork, and excessive indulgence in alcohol or tobacco, or both. A very large proportion of the patients with hyperchlorhydria are aggressively hard workers, knowing no obstacles that cannot be overcome. With such

the wear and tear on the nervous system is great. Hence, it is necessary in their cases to inculcate as far as possible more reasonable methods of living. While thus controlling one's disposition in the face of temptation, it is also wise to avoid the wear and tear incidental to enforced control by keeping out of temptation's way. Undue excitement, limitation of mental labor, are important.

Temperamental conditions have much to do with certain bad eating habits, notably hurried or imperfect mastication of food. This is an important cause of hyperchlorhydria in that it introduces into the stomach imperfectly prepared particles of food, which necessarily act as local irritants, and stimulate an unhealthy secretion.

The bad influence of alcoholic liquors in producing hyperchlorhydria must be recognized, and not even the lighter wines, much less whisky or brandy, be permitted.

Tobacco is not uncommonly almost the sole cause; some cases recover promptly when the weed is abandoned, and very few fail to receive great benefit by total abstinence in this respect.

The question of rest and exercise is one concerning which we must not be too dogmatic. In severe and long-continued cases, it may be necessary to confine the patient to his bed for two or three weeks. In the majority, however, it is not necessary to have recourse to this heroic procedure; resting for one-half to one hour after each meal being all-sufficient. Our rules for guidance should be based upon the previous habits of the individual and his general nutrition. If he has been a person leading a sedentary life, or has practiced only indoor gymnastics, we are safe in advising out-of-door exercise, such as walking, golf, tennis, bicycling, horseback exercise, driving, etc. In each case the physique of the patient must be studied before specifying the exercise to be taken. Persons who have been in the habit of exercising regularly in the open air should be examined carefully as to their methods, for it may well be that they carry their hobbies to an excess, Persons who are under-weight are better treated by a system of rest; the corpulent, by judicious exercise.

The nervous system demands systematic attention. Its defects will be controlled in great degree by the measures advised above. In addition, we find that the regular use of the morning cold sponge bath, followed by brisk friction to produce a reaction, will act as a great invigorator. Excessive or improper sexual indulgence must be abandoned.

In very obstinate cases, the only relief is found by giving up all work, and leaving home, and taking to a life in the woods. Although the surroundings are such as to make a varied diet or good cooking impossible, it is astonishing to note the remarkable improvement following this course.

When prescribing the diet, two factors must be borne in mind. First, it is essential that nothing which irritates or stimulates the stomach in an

undue manner should be permitted ; and, secondly, food that will combine with a relatively large quantity of free Hydrochloric acid must be prescribed. To fulfill the first of these indications, nuts, fruits, pips, condiments of all kinds, alcoholic beverages, salads, and food unduly hot or cold, must positively be forbidden. Opinions differ as to the value of coffee. Some forbid it entirely ; others advise it in moderation. Experience teaches that in most instances a single cup at breakfast, taken without sugar or cream, does no harm, and is sometimes beneficial.

Authorities differ as to the proper diet. The majority of clinicians favor a diet consisting largely of proteids, as these substances are capable of neutralizing much larger quantities of free Hydrochloric acid than are the carbohydrates. Hemmeter and some others dissent from this, claiming that proteids serve to stimulate an already too great flow of hyper-acid gastric contents, and so advise a diet consisting mainly of vegetables. The scientific abilities of the disputants make it impossible that either can be wholly wrong. Hence, it is probable that careful differentiation will enable us to discover cases which thrive on one of these plans and not on the other.

All proteids do not exhibit the same ability for combining neutralizing free Hydrochloric acid. Van Valzah states that 100 grm. of the following foods, when cooked, require about the following quantities of a three to one thousand solution of Hydrochloric acid before Hydrochloric acid will remain free : Lean beef, 650 cc. ; veal, 710 cc. ; mutton, 630 cc. ; milk, 120 cc. ; roll, 105 cc. ; whole wheat preparations, 200 cc. ; rice, 230 cc. ; chicken, 640 cc. ; fish, 250 cc. ; cheese, 300 to 800 cc. ; lean ham, 720 cc. ; eggs, 400 cc. Calves' brains, thymus, sausage, and liver have low combining powers.

Starches must be limited, as a rule, for the excessive acidity of the gastric contents retards their conversion into sugar. Potatoes may be permitted in small quantities ; cabbage, turnips, must be forbidden entirely. Fats have been demonstrated to have the power of inhibiting Hydrochloric acid secretion ; hence, the free eating of butter to the extent even of four ounces daily is to be advised.

Opinions differ likewise as to the frequency of meals. The best authorities concur in advising three regular meals daily, and two or three light lunches. The general nutrition of the patient, and his tolerance for this plan, must be our guide. Certain it is that in many instances patients obtain marked relief from the taking of food.

Water is to be advised at meal time. It serves to dilute the gastric juice, and lessen the local irritation excited by it. The alkaline mineral waters, especially if carbonated, are very useful. They neutralize the excessive acidity, and the Carbonic acid gas has a soothing influence on the gastric mucous membrane. Carbonated waters should be forbidden, however, if there is atony of the stomach.

Lavage is rarely useful in uncomplicated cases of hyperchlorhydria. If the disease is associated with dilatation or motor insufficiency it is invaluable.

Pain may be controlled by hot compresses on the epigastrium, or the administration of alkalies. Ordinarily, Bicarbonate of Soda gives the most satisfactory results. If the bowels are constipated, Magnesia usually is preferable.

The chewing of spruce gum for the purpose of increasing salivary secretions has been highly recommended by Roberts and others. The theory upon which its prescription is founded would seem to be faulty, for the increased saliva cannot be expected to neutralize the gastric hyperacidity. It may do some good because of its power to convert starches into sugar.

Medicines for hyperchlorhydria have been recommended without number. Those appended are the ones which enjoy the best reputation.

*Nux vomica* or its alkaloid, Strychnia, should be prescribed on constitutional or etiological indications. It is adapted to nervous, debilitated men, who have been slaves to business cares, and who are irritated or inconvenienced by every little annoyance. They may have been addicted to highly seasoned foods, alcoholic beverages, and persistent use of purgatives.

*Lycopodium* is indicated in cases attended by a high degree of flatulence in association with constipation. The appetite is excessive, but is appeased by very little food. The urine contains perceptible quantities of uric acid sediment.

*Ignatia* is suited to cases occurring in women as the result of violent emotions, especially grief.

*Magnesium phos.* is called for when there are gaseous eructations with abdominal distention, burning pains in the epigastrium, and constipation.

*Chininum arsenicosum* in cases in which the hyper-acid condition alternates with one of decrease of acid. There is thirst, and yet water and food disagree.

*Kali phos.* in hysterical erethistic persons who are full of gloomy forebodings. They have difficulty in getting to sleep at night ; and yet, when successful, spend the night in exciting dreams. Passage of large quantities of urine of low specific gravity.

*Robinia* is recommended by Halbert on a purely symptomatic basis. Low-spirited mental state ; constant sour eructations ; vomiting of intensely sour fluid ; sharp burning pains in the epigastrium, worse when the stomach is empty, and relieved by taking some food. It must be given over long periods of time to secure results.

*Argentum nitricum* is useful in long-standing cases with secondary changes in the stomach. The digestive power of the gastric secretion and

the motor function of the stomach are both lessened. Flatulence is excessive, and gases are ejected with force.

*Hydrastis canadensis* in hyperchlorhydria associated with atonic dyspepsia or preceded by chronic gastric catarrh, an unusual sequence.

*Orexine tannate* has been suggested by Halbert for old and obstinate cases, and for the gastric perversions which follow hyperchlorhydria. The undigested food remains in the stomach and irritates it. Both muscular and mucous atonicity appear.

*Atropine sulph.* has been recommended on physiological grounds. It is as ardently advocated by some as it is condemned by others. In doses of one two-hundredth of a grain, it certainly gives relief in many cases. Some persons are very sensitive to it, and after about ten days of its use the dose must with them be decreased by one-half, owing to the very annoying dryness of the throat and dilatation of the pupils.

### Deficient Gastric Motility.

The clinical value of deficient gastric motility is not appreciated as it should be from a therapeutic standpoint. The stomach is capable of extensive disease, even to the complete abolition of all digestive function, and yet if its motility is intact the patient experiences little or no discomfort. It constitutes, therefore, a very important condition to which it is at times necessary to direct all our remedial measures. In treating it, we must ever keep in mind its causes, namely, organic changes narrowing the pylorus and agencies leading to weakness of the muscular coat. Those of the former class, which may be properly called mechanical, require for ideal results surgical intervention. The latter may be classed as myelasthenic, and are dependent upon irrational modes of life and careless habits in eating. To cure it, the etiological factors must be corrected. Especially is it of importance that all food taken be thoroughly masticated. Some cases originate in attacks of peritonitis and repeated pregnancies. These must be treated by suitable supports or bandages. If it is dependent upon anæmia, or is a sequel of an acute exhausting disease, the treatment involves the administration of reconstructives and a highly nutritious diet. Care must be taken lest the overfeeding be persisted in too enthusiastically, as overtaxing the stomach may aggravate the evil it is designed to prevent.

The indications are the *prevention of stagnation of food and the improvement of the muscular tone of the stomach.*

Our therapeutic measures will depend in great measure upon whether gastric dilatation of the stomach has or has not supervened.

**Diet.**—The proper feeding of a patient with gastric atony has been the subject of considerable discussion. Experience teaches that some cases thrive best on small meals taken at short intervals; others, on large meals but twice daily. Which plan is suitable for individual cases can be deter-

mined only after experiment. In the latter case, the meals should be taken at 8 A.M. and 3 P.M. The idea is to give the stomach as much rest as possible. In severe cases, it is advisable to order the rigid local and general rest advocated for the cure of gastric ulcer, namely, rectal alimentation, which should be continued for from two to three weeks. Then there should be a careful return to feeding by the mouth.

An exclusive milk diet does not have much to recommend it, as large quantities of this nutriment must be administered to maintain nutrition, thus introducing more weight into the stomach than it should stand, thus producing gastric dilatation.

It is the better plan to make a routine practice of treating all cases on the plan of small feedings at short intervals; intervals not too short at first. Feedings may be made more frequent when the tolerance of the patient is established.

The particular articles of diet permissible are to be determined only after careful analysis of the gastric contents after a test meal. If hydrochoric acid is abundant, meats and other solids, especially those of a highly nutritious character, must be ordered. The meats must be finely divided. Other foods prescribed include eggs, vegetables, as carrots, spinach, beans, peas, cauliflower, rice, wheat bread, and tapioca.

With the improvement of the patient, the quantity administered at each feeding may be increased, and the interval between meals increased. It must be remembered that it is irrational to keep the stomach more or less at work at all hours.

When it is known that pyloric obstruction exists, the diet must be liquid.

Alcoholic beverages must be forbidden. This statement is made in full knowledge of the fact that their administration ofttimes brings temporary relief through general and local stimulation.

When the patient cannot take comfortably the requisite amount of nourishment by the mouth, supplementary rectal feeding must be instituted.

Water is necessary to quench thirst. The quantity permissible should not be over two or three pints in the twenty-four hours. The treatment of gastric myelasthenia by hot-water drinking is to be discountenanced. When the patient cannot take sufficient water to allay thirst, the introduction of water high into the colon is necessary.

Lavage is a very valuable adjuvant. It must be repeated daily. But a pint of water should be introduced into the stomach at any one time. It should be performed in the evening, and not followed by gavage. These instructions are important, for the stomach obtains rest by being kept empty over night.

Rest after feeding is required of all excepting the lightest cases. The patient must lie down for a period of thirty minutes to one hour after each meal.

Electricity will do much towards restoring the deficient gastric tone. The faradic current is usually the one indicated. The best results are obtained by intragastric applications by Einhorn's deglutible electrode. The seances should be repeated on alternate days, and continued for five to fifteen minutes each time.

The general condition of the patient may be much improved by cold baths taken each morning on rising, and followed by brisk friction. Some cases are greatly benefited by the Scotch douche directed to the epigastrium. Cold douching by the tube is also of service.

Massage, while of value, is greatly overestimated. I believe it of more benefit when given generally to bring about nutrition changes than when directed to the stomach or abdomen exclusively.

The remedies to patients suffering from atonic dyspepsia must be prescribed largely on a symptomatic basis, so varied are the constitutional and local phenomena with which it is associated. *Nux vomica* and its alkaloid, *Strychnia*, *Hydrastis*, *Creosote*, *Lycopodium*, *Pulsatilla*, and *Orexin* find the most favor.

Constipation must always be corrected. Special care is required respecting the abuse of laxative medicines, as their overaction tends to aggravation of atoxic dyspepsias. The curative measures for chronic constipation, as advocated in the next chapter, must be enforced.

### Achylia Gastrica.

As achylia gastrica is dependent upon organic changes in the secretory structures of the stomach, its cure is out of the question. The most that can be done is to regulate the diet and general habits of the patient so as to secure for him a life of comfort. Functional achylia gastrica dependent upon neurotic states has been claimed. While not denying its possibility, the most experienced gastrologists and clinicians entertain little faith in its existence. If such a condition does exist, it must be treated upon general principles directed to the improvement of the tone of the nervous system.

If the motor power of the stomach of a patient with achylia is preserved, but little discomfort ensues from the secretory deficiency. One great indication in treatment, therefore, is the maintenance or improvement of gastric motility. If damaged beyond restoration, gastro-enterostomy must be performed. If impaired, the treatment already recommended for deficient gastric motility must be enforced.

The regulation of the patient's diet is the most important factor in his management. It must be so arranged that the food shall remain in the stomach for a minimum time, and of such a character as to be especially adapted for intestinal digestion. Its exit from the stomach is favored by its administration in a finely divided state, or as mushes, purees, soups, etc.

Meat is permissible in small quantities. Particular attention must be given to its thorough subdivision before swallowing. The bulk of the food should be vegetables, including cereals, from which cellulose has been removed, rice, tapioca, potatoes, peas, lentils, oats, white bread, etc. Eggs are good, taken soft boiled, or in a raw state added to soup or coffee. Butter is to be especially recommended.

It is of the greatest importance that the patient take a sufficient quantity of food daily to secure nutrition. It is better, in most cases, to err on the side of slight excess, rather than on that of deficiency. A proper balance is soon discovered and maintained. When cases first come under treatment, it is wise to order small feedings at comparatively short intervals. In all cases it is important that the digestive peculiarities of the patient be ascertained and respected, in a measure at least, when making out his diet list.

Liquids are, as a rule, well born; indeed, are necessary because of the deficiency of the normal gastric fluids.

When the patient is in a state of reduced nutrition or is anæmic, he must be confined to bed until his general health is improved.

Theoretically, the administration of digestive agents, as Pepsin and Hydrochloric acid, is indicated. Practically, we do not get expected results. Hemmeter strongly advocates the administration of twenty drops of the officinal dilute Hydrochloric acid every twenty minutes after meals until sixty drops have been taken. It is important that it be administered in plenty of water and through a tube. Others advise against its use, as tending to interfere with intestinal digestion. It would furthermore seem to interfere with the continued action within the stomach of saliva on hydrated starch. Experience must be the guide as to its use.

Certain vegetable digesting agents may be employed with advantage in some cases. These include the fresh juice of the pineapple, and various pharmacopœial preparations of the Carica papaya.

# CHAPTER IX.

## DISEASES OF THE INTESTINES.

### Acute Catarrhal Enteritis.

Under the above heading will be considered the treatment of the conditions commonly known as diarrhœa and cholera morbus. The former is the main symptom of acute catarrhal enteritis; cholera morbus presents a much greater severity of symptoms, which include vomiting, purging, and pain, the entire clinical picture bearing a fairly close resemblance to epidemic cholera.

In the case of the average healthy individual, an acute catarrhal enteritis originating in a dietetic transgression, subsides very promptly without any treatment whatever, other than slight restrictions in the character and quantity of food taken. The diarrhœa in such patients is a conservative process, and serves to expel from the intestinal tract remnants of food which would do considerable harm were they permitted to remain. Other individuals are less fortunate, being liable to suffer from diarrhœal phenomena following exposure to cold, over-eating, or the taking of unusual foods. With such patients the treatment must be carefully planned. Between these two extremes, we may find all grades of acute catarrhal enteritis, to which the physician must adapt his treatment with such judgment that the patient will not be unduly restricted on the one hand, or permitted too many liberties on the other. If one is to err, it should be on the side of over-caution, especially when dealing with the acute diarrhœas of infancy and old age.

Whenever possible, the patient should be kept physically at rest, as quiet greatly lessens the activity of the intestinal peristalsis. In moderately severe cases, the patient should be ordered to bed. In cases of cholera morbus, the sufferings are sufficiently severe to force the patient to bed without the command of the physician.

As the illness is one likely to be of short duration, the question of nourishment for supporting the patient is not an important one. In fact, the less food the patient takes the more is the inflamed intestinal tract rested, and the more rapidly will recovery ensue. Usually, some food is demanded. The articles to be permitted include rice water, barley water, weak tea with a little cream, dry toast, milk toast, clear broths with or without eggs, and milk. The article of diet last mentioned is one recommended by physicians in a routine way in the treatment of all intestinal disorders. While it is in-

valuable in the great majority of cases, one will meet with very many instances in which it does not fulfill the indications demanded of a food in the course of acute intestinal catarrh. It is far more likely to adapt itself to the patient if it is peptonized or boiled. In some cases, it proves very acceptable if diluted with one-third of its bulk of carbonated or lime water.

Patients with cholera morbus can rarely tolerate any food whatever. With them, it is the best plan to withhold all food, or at most, administer small quantities of rice water or whey until the vomiting has ceased and the stools have commenced to resume their fæcal character. The dehydration of the body by the vomiting and diarrhœa usually excites a high degree of thirst, which is best treated by giving the patient small quantities of ice. With the subsidence of the actively severe symptoms, the treatment of the case is that of ordinary catarrhal enteritis, with the exception that greater care must be exercised in granting the patient increased liberties as he improves.

As to drinks, they are to be regarded as harmful excepting in small quantities. Thirst must be gratified either by small sips of water or the occasional sucking of pieces of ice.

The rapidity of return to the normal diet must be governed by a knowledge of the patient's past history respecting diarrhœal disorders and by the severity of the present attack. The articles to be permitted as improvement progresses include soft-boiled eggs, boiled rice, milk toast, dry toast, raw oysters, oyster broth, and scraped meat with soda crackers. Finally, the patient may be allowed baked potatoes, chicken, and his usual regimen.

In the majority of cases, pain is not sufficiently severe to demand special measures for its relief. If at all severe, the best treatment is the application of a hot compress or a hot-water bottle to the abdomen. When these fail, Morphia may be administered, better hypodermically than by the mouth. Its use should be postponed until it is evident that the gastro-intestinal tract has been cleared of all irritants. In cases of cholera morbus, it is especially valuable as a palliative when the disease has reached the stage at which all the gastro-intestinal contents have been evacuated, and the patient is suffering from empty retching and ineffectual urging to stool. As a rule, a single dose of one-eighth to a quarter of a grain is sufficient.

Of the remedies suitable in the treatment of acute catarrhal enteritis, *Cinchona*, *Arsenicum album*, or *Cuprum arsenicosum* is indicated in the majority of cases.

*Cinchona* is adapted to those cases in which the characteristics are the loose movements, flatulence, and absence of pain. The usual cause of the Cinchona case is the eating of fruit, especially in hot weather. Sometimes the stools are found to contain undigested food. The drain on the patient is ofttimes sufficient to cause considerable exhaustion, for which condition Cinchona is an especially valuable remedy.

*Arsenicum Album.*—The etiological factor in the Arsenicum case is excessive indulgence in cold drinks, especially after having been overheated. It is the principal remedy in cases arising from eating spoiled food. Weakness or prostration is well defined, and occurs independently of the severity of the diarrhœa. Thirst and restlessness are prominent features. The stools are usually brownish or blackish, and offensive. Sometimes they contain blood, and are attended by considerable tenesmus. Pain, when present, is of a burning character. The special period of aggravation of symptoms is after midnight. Arsenicum is also one of the remedies for the violent cases of cholera morbus, being indicated by the profuse vomiting and purging, the discharges being of a watery character.

*Cuprum arsenicosum* is prescribed very largely on empirical grounds. It is much used by old-school physicians in small doses (gr. $\frac{1}{500}$ to gr. $\frac{1}{100}$). It is indicated by stools containing large quantities of mucus, cramp-like pains in the abdomen, tenesmus recti, and prostration.

*Aconite* is occasionally useful in the initial stages of acute enteritis arising from exposure to cold, especially during the autumn months, when hot days are followed by cold nights. Fever with dry skin is usually present. The stools are watery, slimy and bloody.

*Gelsemium* is adapted to cases of diarrhœa resulting from emotional causes, as fright. The stools are yellow and papescent.

*Belladonna* is indicated in the early stages when the high fever, moist skin, and full bounding pulse suggest the acuteness of the intestinal inflammation. The large intestine is especially affected. The patient complains of considerable straining at stool (tensemus recti), and the stools are slimy and bloody. It is, as a rule, indicated only in the early stages of the attack.

*Ferrum phosphoricum*, like Cinchona, is suited to cases in which the stools contain undigested food. Fever is present, but is attended by a low vascular pressure. The stools are blood-streaked.

*Colocynth* has as its characteristic symptom griping, colicky pains forcing the patient to bend double for relief. Unlike Belladonna, these pains are relieved by pressure. They disappear or are ameliorated after stool or escape of flatus. Still, the latter is not a necessary indication, for occasionally Colocynth is useful, notwithstanding the fact that the colic is worse immediately after an evacuation.

*Croton tiglium* is indicated by the character of the stool, which is profuse and watery. In color it is yellowish, and is ofttimes associated with nausea and vomiting. Colicky pain is present, and is relieved by the taking of warm drinks.

*Argentum nitricum*, like Gelsemium, is suited to diarrhœa arising from nervous causes, especially excitement. Still, its use is not thus limited, for it is indicated in secondary intestinal catarrhs, the stools consisting of blood,

mucus and epithelium, and presenting a green color. They are attended by considerable flatulence.

*Phosphoric acid* is indicated in cases in which, though the diarrhœa is profuse, and stools are frequent, the patient is not greatly exhausted thereby. There are considerable rumbling in the abdomen and expulsion of flatus.

*Podophyllum* is suggested by profuse watery stools with aggravation in the early hours of the morning. It, *Iris*, *Chionanthus*, *Ipecac*, and *Cinchona*, are useful when the trouble is located in the small intestines.

The line of cases classed as cholera morbus requires about the same remedies as those already suggested in the treatment of epidemic cholera, namely, *Veratrum*, *Cuprum*, and *Camphor*. I might add in this connection an experience of many years ago, one with a gentleman of middle age who had attacks of severe vomiting and purging recurring on alternate days, which failed to yield to the ordinary remedies. This case was very promptly cured by Quinine in material doses, suggested by the periodicity of the recurrence, and the fact that he had recently returned from a malarial district. Diarrhœas of malarial origin are not uncommon, though very few of them present the characteristic periodicity observed in this case. Whether or not this feature be present, their most efficient remedy is *Quinine*. Arsenic should be thought of in those few cases in which Quinine fails to effect a prompt cure.

When acute enteritis has been the result of over-eating or undue indulgence in alcoholic beverages, the best remedy is *Nux vomica* without regard to symptoms. In many of these cases it is a wise plan to secure a thorough emptying of the gastro-intestinal tract by the administration of Castor oil or Calomel.

The mercurial preparations find their sphere of utility in cases which have not inaptly been described as dysenteric diarrhœa. Their main features are the violent rectal tenesmus and the mucous and bloody stools. A differentiation is based more on the severity of the symptoms than upon their special features, the order of intensity being *Mercurius dulcis*, *Mercuris vivus*, and *Mercurius corrosivus*.

The use of opiates in the treatment of diarrhœa or acute enteritis is to be condemned as irrational. Undoubtedly these preparations do serve to keep the activity of the bowels in check; but, on the other hand, they cause the retention of substances which must by their irritating character perpetuate the disease. It is much more rational to adopt the opposite course of administering drugs which empty the bowls thoroughly, as Castor oil and Calomel. As indicated above, the only rational use of the opiates is found in those cases in which vomiting and purging have ceased, and there remains a highly irritable or inflamed gastro-intestinal mucous membrane, which demands rest.

Certain astringent preparations are of value in protracted cases. The

remarkable improvement following their administration should not lead to their too early exhibition. The principal drugs in this connection are *Tannigen* and *Tanalbin*. I know of no differential indications. They serve as astringents pure and simple. They are best prescribed in capsules, from five to ten grains being administered every two hours. The diarrhœa usually ceases within twenty-four hours, after which the dose should be lessened and the intervals lengthened.

There is a class of cases characterized by constipation alternating with diarrhœa. Most of these are primarily ones of constipation, the retained and hardened fæcal matter acting as a local irritant. The indications here are for early and thorough evacuation of the bowels either by a full enema or purgation with fractional doses of Calomel, repeated at short intervals—*i. e.*, gr. $\frac{1}{5}$ to gr. $\frac{1}{10}$ every hour until 1 grain of the crude drug has been consumed.

### Chronic Intestinal Catarrh; Chronic Diarrhœa.

A consideration of the treatment of chronic intestinal catarrh in the same section with that of chronic diarrhœa hardly seems appropriate in view of the fact that chronic catarrhal enteritis is not always attended by diarrhœa, and chronic diarrhœa is very frequently dependent upon other lesions than catarrhal inflammation of the intestinal mucous membrane. Inasmuch as both affections demand the same line of treatment when diarrhœa is a symptom of chronic intestinal catarrh, the consideration of their treatment in the one chapter seems appropriate, especially as one has the opportunity of explaining by contrast the remedial measures required when the clinical manifestations of the two disorders diverge.

In undertaking the treatment of a chronic diarrhœa, one must make a most careful analysis of the case to determine the fundamental lesion producing this troublesome symptom. Indeed, we may not be obliged to deal with an intestinal disorder at all. Thus we may have a chronic diarrhœa originating in gastric disorder. For example, in achylia gastrica, the stomach does not digest the food, which is then transferred to the intestines imperfectly prepared. If the intestines happen to be in condition to do more than the normal amount of work required of them no trouble ensues. If, on the other hand, they are merely able to care for the ingesta as prepared by a normally acting stomach and no more, they rebel at the extra work and chronic diarrhœa or chronic catarrhal enteritis follows. In such cases, it is obvious that our treatment to be successful must take cognizance of the deficient gastric digestion.

Another good example of extra-intestinal causes of chronic diarrhœa is found in those cases which have a purely neurotic basis. The successful management of a case of chronic diarrhœa then demands that the physician must examine the patient as an entirety. Especially must he bear in mind

that the symptom may result from such extra-intestinal causes as disease of the stomach, neuroses, tabes, malaria, atypical gout, chronic interstitial nephritis, bad hygienic surroundings, and portal congestion. Of the intestinal lesions capable of producing it, may be enumerated chronic intestinal catarrh, ulceration, atrophy of the intestinal mucous membrane, amyloid disease, interstitial stenosis, malignant and other local lesions of the rectum.

Not only must the cause of the diarrhœa be determined, but judgment must be exercised as to the propriety of interference. Thus, in those cases attendant upon interstitial nephritis, the frequent evacuations are ofttimes a conservative process, tending to relieve the kidneys. A suppression of the diarrhœa may provoke a fatal uræmia.

Notwithstanding the great variety of causes and pathological lesions in chronic diarrhœa, one can very conveniently outline a standard plan of treatment, departures from which may be made as indicated by special clinical features of the case in hand. The first element in successful treatment is rest of both body and intestines. This may be regarded as the most difficult condition to fulfill, and therefore the most important. Its enforcement secures the carrying out of most of the remaining hygienic measures so essential to a cure. In the severe cases, the patient is confined to bed by force of circumstances. The only difficulty encountered by the physician is in keeping him there during the periods of temporary improvement. In the so-called mild cases, rest in bed is difficult of enforcement. Not infrequently the necessary rest is to be secured only by a peremptory demand that the proper course be followed. The period of absolute rest in bed should be continued until the patient has had normal stools for at least one week. Then he may be allowed liberties in being up and about, but always graded according to his strength and progress.

The standard diet for cases of chronic diarrhœa is milk. This, in conjunction with absolute rest in a well-ventilated room, will cure a very large proportion of cases. All cases, however, do not thrive upon it. The milk may not be digested easily. It is therefore often wise to peptonize it, or mix it with lime water, vichy, seltzer, or Bicarbonate of Soda.

After the diarrhœa has been controlled, the diet should be extended. When the intestines are at fault, the bulk of the digestive process may be thrown on the stomach. To this end, the patient may be given different preparations of raw scraped meat. Of these to be especially commended are sandwiches made with raw scraped meat pulp, raw meat balls consisting of scraped meat mixed with cream and rolled rapidly over a hot tin plate, and meat pulp used as thickening of beef tea. Another dietetic expedient is the administration of bread, not too fresh, upon which has been spread a diastasic extract of malt, as Trommer's or maltine. The various cereals which contain mucin, as farina, barley, rice, and oatmeal may be ordered in the form of gruels. They may be made more acceptable to the digestive tract by the previous addition of the diastasic malt.

Throughout the management of the case, the diet must be outlined with two objects in view, one the securing as complete rest as possible of the diseased parts ; and the second, the maintenance of general nutrition. In comparatively recent cases in which the general health is still good, the former indication is the paramount one. In the old cases, we are obliged to enforce rest for a time. At the earliest possible moment, we must substitute a diet which shall cause the patient to put on flesh or at least to increase his strength. It is here that we may order easily digested fats, as butter and cod liver oil. Some physicians object to these, and no doubt with justice, for there are cases in which they may prove prejudicial.

*In all cases it is necessary to bear in mind that one is treating a condition of long standing, the natural tendency of which is to go from bad to worse, and relapse very liable to follow upon improvements. This fact warns us that we must persist in the enforcement of measures which we know to be right until they have brought about the best possible results. Attention to this axiom will save us from many failures.*

When adding still further to the diet list, we must remember that we should select articles which are readily digested, and avoid those of coarse character, especially substances containing much cellulose, organic acids, and sugars. Among the drinks, we must forbid iced water or any kind of water in large quantities, beer, and champagne. The influence of the temperature at which fluid should be taken is an important matter. Hot drinks tend to quiet peristalsis. Thus it is that hot milk very often agrees when cold milk has proven a complete failure. A very good astringent drink, which owes it popularity to its advocacy by Boas, is " Eichel cocoa," which is a mixture of ground acorns and pure chocolate and contains about two per cent. of tannin.

If patients demand that food be sweetened, and sugar is inadvisable, one may rely upon saccharin, which is a good intestinal antiseptic. Another good astringent drink is Winternitz's decoction of huckleberries; 250 grames of dried huckleberries are mixed with one liter of water and boiled down to 750 cc. The berries are then pressed out, strained through a cloth, and the juice thus obtained added to the 750 cc.

Boas's diet list for chronic diarrhœa which has been extensively quoted is as follows :

8 A.M.—" Eichel cocoa " (in water), one saccharin tablet (or crystallose), toast and butter (20 to 30 grammes).

10 A.M.—One cup (200 grammes of rice gruel, buckwheat or oat grits in veal bouillon (avoid salt). In addition, 50 grammes of roasted veal or beef scraped, or fried fish or cold meat (avoid salt or strongly pickled ham).

1 P.M.—Soup of peas or beans or puree of oatmeal, farina, or corn starch, etc. (addition of nutrose, tropon, or eucasin allowed ; somatose forbidden). In summer, huckleberry soup (with saccharin, if desired) ; 200

grammes of rice bouillon (avoid rice with milk), or farina bouillon well thickened by cooking. Green vegetables or potatoes in puree form (50 to 100 grammes). Meat and fish (fat excepted), 50 to 100 grammes (butter sauce allowed; cream sauces or highly seasoned sauces forbidden). Stewed fruits, with the exception of huckleberries and cranberries, forbidden. Custards (corn starch with a little yolk of egg and saccharin) allowed. (Avoid fruit juices). As beverages, huckleberry wine, Burgundy, Camarite, Simaruba wine, old Bordeaux. (Sweet wines and effervescent beverages forbidden.)

4 P.M.—Tea without milk, with saccharin or cocoa. Cakes, toast, zwiebach (with butter).

7 P.M.—Strained gruel (oatmeal, etc.). Cold or warm meat (50 grammes), toast, butter 20 grammes. One or two glasses of huckleberry wine.

9 P.M.—One glass of huckleberry lemonade (made by adding one or two teaspoonfuls of huckleberry jelly to boiled water), warm or hot mulled wine (saccharin), or tea, with red wine.

The above diet list is not intended by its author to be used dogmatically. On the contrary, he expressly states that the individual peculiarities of given cases may demand that one or more of the articles mentioned shall be excluded. He furthermore makes the express warning that "sugars, pastry, organic acids, beer, effervescing beverages, cold drinks, fruit ices, should be positively avoided for months, and in many cases for years."

Diarrhœas of special character fail to yield to the plans already outlined. For example, those dependent upon gouty diathesis should be treated as ordinary cases of gout, and the result is surprisingly good.

Nervous diarrhœas do better with limited dietetic restrictions. Such cases are best managed by having the patient resist the desire for stool as long as possible, just as nervous desire for frequent micturition is treated by ignoring the inclination as long as possible. In addition to Gelsemium as the remedy for the acute cases, *Arsenic* in the form of Fowler's solution in half-minim doses is efficient in the chronic cases. Sometimes the dose of Arsenic must be increased to as much as five drops three times daily before a successful result is secured.

Next to diet and rest, comes warmth as an adjuvant in the treatment of chronic diarrhœa. From the very beginning of the treatment, it is a good plan to have the patient take warm baths daily. The application of hot moist poultices to the abdomen is distinctly beneficial in many instances. Some attention to technical detail must be paid to these poultices. They should be prepared hot. To make sure that they shall not burn the skin, a couple of layers of thin flannel must be placed between the poultice and the abdomen. Otherwise, it will be found that the poultice must be cooled to a point below which it loses its therapeutic efficiency. In cases in which

the hot abdominal poultice is not considered advisable, the patient should wear (even while in bed) a flannel abdominal binder. The use of the latter may be continued for many months after recovery has been secured, and may be regarded as an excellent prophylactic against relapses. In all cases, it should be remembered that chilling of the surface is prejudicial. Ventilation, while necessary, should be carried out in such a way as not to expose the patient to unnecessary chilling of the bodily surface.

The lack of exercise necessitated by a rest treatment, may be atoned for by regular and properly administered massage of the extremities. Manipulation must not, however, be regarded as a regular procedure in the treatment of chronic diarrhœa, but as a measure that will increase the general tissue changes in certain limited number of cases. In chronic intestinal catarrh with constipation it is ofttimes invaluable.

The last indication in the treatment of chronic diarrhœa is cleanliness of the intestines. In most cases, this is to be secured by irrigation of the large intestine. This line of treatment is of value mainly in cases in which the colon is the *locus mali*. As a rule, plain water or a thin starch paste may be used for this purpose. If these simple enemata fail, they may be medicated by the addition of one of the following drugs in the proportions indicated: Bismuth carbonate, grs. x–℥j; Boric acid, gr. j–℥j; Thymol, gr. ⅛–℥j; Silver nitrate, gr. ss–℥j; the enema may be discharged at once or retained, for a length of time, as the judgment of the physician indicates.

In the beginning of this article reference was made to disease of the rectum as a cause of chronic diarrhœa. It is suggested that a routine examination of the rectum should be made in all cases presenting the symptom under consideration. Prominent among the lesions of interest in this connection is prolapse of the sigmoid flexure. This is to be treated by evacuating the bowels thoroughly by a small enema every morning. This should be followed by an astringent injection of tincture of *Catechu*, two fluid drachms in two ounces of water, and retained.

When a diarrhœa is the result of malignant disease of the rectum or sigmoid, the indication is for the use of sedative suppositories, of which the following, proposed by Lauder Brunton, is an excellent formula: Extr. Bellad., gr. ss; Morphia, gr. ⅓; Cocaine, gr. ss.; Ol. Theobrom. q. s.

A morning diarrhœa is very often readily controlled by directing the patient to abstain from all fluids after 5 P.M. each day.

A diarrhœa, the characteristic of which is urging to stool immediately after taking of food, is best treated by the administration of Bismuth immediately before eating.

Intestinal antisepsis is hardly practicable. The drugs recommended for securing this result are, as a rule, either inefficient or dangerous. Calomel is generally regarded as the drug most likely to produce the best result. Its use in diarrhœas of chronic character is limited to gouty cases, in which

it ofttimes acts as if by magic. Brunton suggests that the best means of ridding the intestines of bacteria is by starving them out. He very correctly points out that abstinence of food or complete change of diet brings about this much desired result better than by the administration of any drugs.

A very persistent form of diarrhœa is that attendant upon the late stages of phthisis. In very many instances it is due to over-feeding, and its remedy lies in the correction of the cause. In other cases, it must be treated on lines laid down in other portions of this article.

Special forms of treatment have been advocated for the treatment of chronic intestinal catarrh and chronic diarrhœa, the chief value of which depends upon the fact that they one and all introduce a very large quantity into the system. Of these special cures those which have been especially prominent in the past are the grape cure and the whey cure.

Astringents are valuable in the treatment of chronic diarrhœa. Of these, Tannigen is the most efficient. It should be administered in capsule form, in doses of from five to ten grains every two hours until relief is obtained, when the intervals between doses is to be increased. With it, I have succeedèd in curing within a month's time a diarrhœa that had continued unchecked for thirty years. Another drug which has stood me in good stead in two long-standing cases, 12 and 18 years respectively, is Iodomuth, a combination of Iodine and Bismuth. This is given in the same way as the Tannigen, and with that drug is a great standby with me in the treatment of old diarrhœas.

The treatment of chronic intestinal catarrh depends upon the symptoms presented, *i. e.*, whether the case is attended by constipation, diarrhœa, or by constipation and diarrhœa in alternation. If diarrhœa is the predominent symptom, the treatment is entirely on the lines laid down for the management of chronic diarrhœa. The majority of cases, however, are attended by constipation; hence, the general management is that to be described hereafter in the article on constipation. In chronic intestinal catarrh, there are several very important points to which particular attention should be directed. In the first place, the continuance of the constipation is to be regarded as a menace to recovery. It must be controlled at all hazards. At the same time, the inflamed condition of the intestinal mucous membrane must be ever kept in mind. If drugs are used to produce easy evacuations, they must be of the mild laxative order, and never the irritant cathartics, which practically always aggravate the condition. The laxatives to be recommended are Cascara and Carlsbad water. Still, it is the better plan to avoid even these when possible and depend entirely upon dietetic measures and oil or water enemata to secure regular bowel action. The diet to be recommended is that of constipation in general; but with this important difference. Coarse articles of food and those con-

taining much cellulose should be positively forbidden. The articles selected should be capable of easy digestion. Food must be eaten slowly. It is better to have the patient take small meals at short intervals than to follow the usual custom observed in the healthy of taking three meals per day.

The question of rest and exercise must be determined according to conditions. Patients whose general nutrition is poor, and who are below weight, generally thrive on rest. Under no circumstances should exercise be persisted in sufficiently to tire or exhaust the patient. If exercise is decided upon, it should be mild at first, and gradually increased as indications warrant.

When there is mucus in the stools, it is a wise plan to order high colon irrigations. The solutions most useful for this purpose are lime water diluted with plain water in the proportion of one to six; or salt solution in the proportion of one tablespoonful of salt to the quart of water. These irrigations are also indicated when there are hard scybalous masses in the rectum and colon.

Special attention must be given to avoid chilling the patient. To this end, he should be made to wear woolen underclothing, the weight of which must be graded according to atmospheric and weather conditions. The possibility of chilling from exposure of the feet and ankles must be kept in mind. Hence, the patient should not be permitted to go about in slippers, and should wear high instead of low shoes. Needless to say, he should not be permitted to walk about in his bare feet.

When constipation alternates with diarrhœa, the case should be studied to determine which of these is the primary condition and the treatment governed accordingly.

The principal remedies for chronic diarrhœa are *Mercurius corrosivus*, *Arsenicum album*, *Cinchona*, *Phosphoric acid*, *Argentum nitricum*, *Podophyllum*, *Sulphur*, *Gamboge*, and *Calcarea*. The indications for most of these have already been given under the heading of acute intestinal catarrh, and need not be repeated at this time. *Sulphur* is indicated mostly for the chronic morning diarrhœas. *Aloes*, in cases in which rectal symptoms are prominent, and there is considerable flatulence. *Calcarea* is indicated almost entirely upon the constitutional condition.

Halbert speaks highly of *Methylene blue* in one grain doses as a means of stopping the mucous discharges. He believes also that it overcomes putrefaction changes.

## The Treatment of Diarrhœa in Infants.

By C. Sigmund Raue, M.D.

There are certain basic facts underlying the treatment of diarrhœa in infants, upon which alone a successful therapy can rest. These facts are applicable, no matter to which one of the various classes of diarrhœa the

case may belong, but aside from them, there is no method of treatment which may be called specific. It is clear, therefore, that unless each case is studied individually and treated according to its particular symptoms and needs, failure will be the result.

Of prime importance in these cases is *prophylaxis*. The exciting cause, the micro-organisms, should be combated, not only by maintaining the general health of the infant at its highest standard, and thus rendering it less susceptible to bacterial invasion, but also by protecting the child from infection through contaminated food, or through bottles or rubber nipples not aseptically clean. Too great stress cannot be laid upon these points. The nipples should be boiled daily, and kept immersed in a saturated solution of boric acid when not in use. As soon as emptied the bottles should be rinsed out and filled with hot water to which a little washing soda has been added. They should be allowed to stand thus until needed again, when they may be cleansed with a stiff brush and thoroughly rinsed in hot water.

If the child is fed at the breast instead of from a bottle, the mother's nipples should be washed, both before and after nursing, with a saturated boric acid solution. If either nipple is fissured, it is unwise to allow the infant to nurse from the affected side directly. A sterilized breast-shield may be used, or the milk may be extracted with a pump and fed to the child with a spoon or a dropper. These methods are simpler and more effective in preventing infection than to attempt to cleanse the infant's mouth after each nursing.

*The disposal of the infant's excreta* should be carried out with systematic care. The diaper must be removed from the child as soon as it is soiled, and it should be sterilized at once by boiling, or placed in a receptacle containing some mild antiseptic solution, such as borax or washing soda, to be boiled later. This is far preferable to the common custom of simply throwing it into a bucket, where it is allowed to dry or still further decompose. Under no circumstances should a wet diaper be simply dried and reapplied to the infant without being washed. The nurse should make it a rule to wash her hands thoroughly whenever she has changed the baby's diaper. Immediately after the removal of the diaper the child should be carefully cleansed. If there is a tendency to erythema about the buttocks, a dusting powder, such as corn starch, talcum or Fuller's earth, may be used. I have found lycopodium power very efficient in many cases. If infection of the skin has taken place, an antiseptic powder is indicated. A good one is made of boric acid one part, zinc oxide and starch, each two parts. When the stools are very frequent and excoriating, a protective ointment of equal parts of zinc ointment and lanolin will be more useful than a powder.

In diarrhœal cases the diapers must be rigorously sterilized. A good

plan is to soak them in a solution of chloride of lime (one-half pound to a pailful of cold water) for several hours, then rinse them thoroughly and boil as usual with soap-suds. After handling the diapers, or coming in contact with the pathological discharges in any other way, the nurse must thoroughly wash her hands with hot water and soap and then immerse them in a solution of bichloride of mercury, (1 : 2000). If this precaution is neglected, not only is there danger of infecting other children, but, as Koplik insists, there is danger also of continually re-infecting the sick child and thus prolonging the disease.

In preventing the development of diarrhœic conditions, supervision of the *food* is of the greatest importance. Breast-fed infants are of course least liable to infection, and it is therefore very unwise to wean a child during the summer unless it is absolutely necessary to do so. Only the purest and cleanest milk obtainable should be used, and if water is added, the latter should be boiled. In hot weather the milk should be pasteurized. Even though we may be able to obtain milk that has been handled in the most careful up-to-date manner, and that is clean and reasonably free from micro-organisms, nevertheless we run the risk of infection if we do not pasteurize it during the summer months. An error in technique in the preparation of the infant's bottles, at even a single step in the process, may result in a fatal case of ileo-colitis. It must not be thought, however, that pasteurization will make dirty milk wholesome. If chemical changes have occurred in the milk, sterilization will not prevent it from acting as a poison. Furthermore, the greatest care should be exercised, after the food has been pasteurized, to prevent its becoming re-contaminated, for dust or dirty utensils are a common source from which putrefactive bacteria may re-enter the food. As the normal bacteria of sour milk (bacterium lactis ærogenes) is destroyed by pasteurization, and as these organisms exert an inhibitory effect upon the growth of other germs, pasteurized milk, if contaminated, is really more dangerous than plain milk.

An important point to bear in mind is that during hot weather an infant cannot, as a rule, digest milk containing as high a percentage of fat and proteids as it is able to take at other times. The same quantity will usually be taken, because the child is thirsty, but unless we decrease the strength of the milk-mixture we may set up a severe indigestion, which in turn will invite enteritis. Do not expect a babe to make its regular weekly gain in weight during July and August.

It should not be forgotten that in warm weather the body loses water more rapidly than in cold, and that the infant will become thirsty between the times of feeding. It should therefore be given, from time to time, an ounce or two of water, previously boiled or cooled.

Careful attention must be paid to the child's surroundings. In summer no infant should be kept in the city if the parents can afford to take

it away. The country and mountains are good; the seashore is better. Even after the infant is seized with ileo-colitis it is not too late to take it out of the city; in fact, its recovery may depend upon this step. The poor and overcrowded are particularly unfortunate in being unable to avail themselves of this mode of preserving their children's health, and as yet we have not sufficient charities to give them even the cheapest of nature's offerings—fresh air. Let them keep the children indoors all day in the coolest room, with the shutters partly closed to keep out the broiling sun, and in the early morning and after sundown take them out to the neighboring parks and squares for an airing. Trolley rides and trips on the water are fortunately cheap, and will help to save many a baby's life.

*Bathing* is most essential during hot weather. The cool or tepid bath is absolutely necessary when fever is present, and may be given three or four times a day. Chapin recommends allowing the children to play in a bath-tub partly filled with luke-warm water.

When *diarrhœa* has developed we must at once make decided changes in the food. The most important step in this direction is to discontinue the use of milk. In a breast-fed infant, however, if fever and vomiting are absent, we may disregard this rule, at least in the beginning, and try to correct the condition with remedies alone. Should the diarrhœa not improve, it will be well to alternate a bottle of barley water with the breast, in this way giving the digestive organs a partial rest. If the diarrhœa becomes progressively worse in spite of this treatment, we must stop the breast-feeding entirely.

The reason milk is discontinued in the diarrhœa of infants is because it acts as a good culture medium for the micro-organisms which are causing the trouble, and because the curds of the casein irritate the mucous membrane. In acute ileo-colitis, milk, even if sterilized, is practically a poison. As Chapin explains it, the bacteria normally present in the digestive tract do not develop to a harmful degree when digestion is normal, but when the vital functions are depressed by hot weather or during acute indigestion, the fermentative organisms develop freely in the whey and putrefactive or gas-producing bacteria flourish unmolested in the curds. Under these circumstances poisonous products of proteid decomposition are formed, and intoxication is the result.

As an all-around substitute for milk, barley water is perhaps the most generally useful food. It is made as follows: Soak one and a half tablespoonfuls of pearl barley in water for some hours; drain and place in a double boiler with a quart of water and a little salt; boil for four hours, adding water from time to time in such quantity that when done the barley water will amount to one pint; strain through cheese-cloth before using. A quicker way of preparing this food is to use barley flour instead of the pearl barley. A rounded tablespoonful of flour boiled for fifteen minutes with a quart of water will make a solution of the proper strength.

One of the chief advantages of barley water is that it leaves very little residue in the gut and thus starves out the bacteria. Sometimes it disagrees or is objected to by the infant. I have previously pointed out* that the particles of cellulose found in barley water may irritate the inflamed mucous membrane. In such cases I use arrowroot, which is blander and more acceptable to many infants. In protracted cases the infant will loose too much flesh if given barley water only, and as milk may have to be withheld for several weeks in some of these cases, particularly when there is follicular ulceration, we must use a more nourishing milk-substitute.

Here it is a good plan to alternate lamb-broth, made with rice and strained, with barley water containing half an ounce of milk-sugar and the whites of two eggs to the pint. Beef-juice may also be used. This is prepared by squeezing the juice from lean rare broiled steak, either with a lemon-squeezer or a meat-press, and adding a pinch of salt. Care should be taken in using this food not to heat it sufficiently to coagulate the albumen which is contained in solution. Another method of extracting the juice is to place finely chopped raw beef in a glass jar with cold water (six ounces to the pound), and a little salt. The mixture is allowed to stand for several hours on ice, with an occasional shaking, and the juice is finally extracted by pressure. The twice-boiled flour-ball is another excellent food, especially for very young infants. Still another valuable substitute for milk is composed of rice water twenty ounces, milk-sugar one ounce, and the whites of two eggs. This sort of nourishment is not so sustaining as the full milk diet, and is more quickly digested, for which reason the child usually requires food every two or two and a half hours instead of every three hours. Beef-juice (five to ten drops), and a little brandy may be added to each feeding when deemed advisable. In infants under four months of age five to ten drops of Cereo should be added to each feeding in order to digest the starch, which at this age may otherwise produce digestive disturbances.

Sometimes it will be found beneficial to restrict cases in which the stools are alkaline to an exclusive carbohydrate diet, giving nothing but broths when the stools are acid. In the end, the most important food during the period when acute symptoms are present is the carbohydrates (sugar and starch), because they represent the only food-stuff which is at all likely to be assimilated, and because they are the best proteid-sparers under conditions of acute inanition. Water is, of course, needed in large amounts to compensate for the loss of fluids.

In returning to a milk diet great caution must be observed. Low percentages, especially of proteids, should be used at first. A tablespoonful

* *Hahnemannian Monthly*, October, 1903.

of milk to four ounces of barley water is a safe beginning. Some writers do not recommend a return to milk until the stools have become normal, but in many instances this results in unnecessary starvation of the child. Personally, I am in the habit of trying milk as above directed when the temperature has been normal for several days and there has been a decided lessening in the number of bowel movements. Should the first attempt prove a failure, condensed milk may be tried after an interval of forty-eight hours. This food sometimes agrees when plain milk is not tolerated, and thus paves the way, so to speak, for a return to the normal diet.

**Special Symptoms and Their Management.**—*Vomiting* is at times a most troublesome complication, especially in cholera infantum. Lavage of the stomach is the most rational and successful method of controlling it. In urgent cases it may be necessary to perform the operation several times a day. When this is done, a little food should be introduced into the stomach through the tube immediately before its removal. Thin arrow-root water or albumen water is best retained under these circumstances.

The food will often be retained better when fed with a teaspoon than when taken from a bottle. When the infant can take only a small quantity of food at a time we must feed it often, but there is nothing to be gained by feeding every five or ten minutes, as is sometimes done.

**Diarrhœa.**—In the early stages of an intestinal infection much benefit may be derived from *bowel irrigation*. It is rare that the gut thoroughly empties itself at once, and if the abnormal intestinal contents are allowed to remain undisturbed for any length of time inflammatory changes in the intestinal mucosa will result. It is true that the irrigating fluid does not reach beyond the ileo-cæcal valve, but, as the colon bears the brunt of the attack in most instances, we help the case materially by cleansing this portion of the gut. Moreover, irrigation stimulates peristalsis, and thus aids in emptying that part of the gut lying above the colon. Aside from the clinical observation that decided improvement in both the local and general symptoms follows the use of these irrigations, a result doubtless due to the absorption of a large amount of fluid as well as to the cleansing of the gut, I have seen in the autopsy of a child who had been irrigated, about half a pint of fluid contained in the transverse colon. The statement that the colon as well as the rectum is cleansed by irrigation is thus demonstrated to be more than a mere theory.

From personal experience I am led to believe that irrigating the colon, like many other procedures, is, on the one hand, too frequently neglected, and, on the other, too often overdone. It must be performed only when indications call for it, and discontinued at once when no longer needed. The following summary may serve as a guide to its use :

The irrigation is best performed by means of a soft rubber catheter, number 20 to 22 French, which is attached to the nozzle of a fountain

syringe and gradually inserted into the rectum *while the water is flowing through it.* By this method it can be readily inserted for a distance of from six to eight inches. After about four to six ounces of water have entered the bowel, the nozzle of the syringe is removed from the catheter and the fluid allowed to escape through the latter. This process is repeated until the water that returns through the catheter is perfectly clear. The last few ounces may be allowed to remain in the bowel. The best solution to use is a quart of tepid water, to which a rounded teaspoonful of salt has been added.

In every case of diarrhœa where the bowels do not promptly empty themselves, and the stools are undigested and foul, irrigation of the bowel is indicated. If the stools are few in number, of a foul odor, and fever is present, the operation should be performed twice daily until improvement follows. After the acute symptoms have subsided and the bowels are emptying themselves thoroughly, the irrigation should be discontinued. If the abdomen remains distended and fermentation is a prominent symptom, the bowel should be irrigated once in twenty-four hours. When mucus persists in the stools, provided it comes from the upper portion of the bowel, irrigation may be continued until the stools become fæcal, but if there is a lesion in the lower end of the intestinal tract, irrigation may aggravate the trouble if continued too long. Many a diarrhœa is kept up by too much mechanical interference.

Irrigation is unnecessary in cases with large watery stools. When tenesmus is a pronounced symptom the practice must be employed with caution and repeated only at long intervals. In these cases small injections of normal saline solution (one or two ounces), are more useful than continued flushing. Small injections of olive oil are also of value on account of their soothing influence upon the inflamed mucous membrane.

In cases with high fever, frequent small stools consisting chiefly of mucus and a little blood, distended abdomen and gut laden with decomposing fæcal matter, mild, cautious purgation is justifiable, and may be used, but I must warn against the indiscriminate and injudicious use of the initial Calomel purge. I can recall several cases in which all chance of recovery was destroyed by the superadded irritation induced by physiological doses of Calomel.

Excessive formation of **gas** in the bowel is usually due to the fermentation of the carbohydrates of the food, and especially when accompanied by acid stools, may be corrected by changing to a proteid diet (broths, albumen water, etc.). The very foul odor of the stools result from proteid decomposition, usually caused by feeding milk that has been contaminated by dust from the stable, or by dirty utensils, etc. Here carbohydrates should be fed exclusively for a time.

High **fever** is best controlled by the bath. Infants may be placed in

the tub two or three times daily, with the water at a temperature of about 90° F.; this is then gradually reduced to 80° by the addition of cold water. Older children are more conveniently sponged with cold water and alcohol. Irrigation of the colon also tends to reduce the pyrexia, and this is still further verified by keeping the child in the open air as much as possible.

**Collapse** requires active stimulation. Brandy may be used when called for by the symptoms, but its continued use throughout the illness as a routine measure is to be condemned. The indications for its use are a soft, rapid pulse and a failing of the muscular element in the first sound of the heart, accompanying the general adynamic condition characteristic of approaching collapse. It may be given, in a young infant, in doses of from ten to twenty drops, well diluted, every three or four hours. An infant one year old may take half a drachm every two hours; this can be increased to one drachm if necessary. When the odor of alcohol can be detected upon the breath we may know that the patient is fully under its influence, and a repetition of the dose becomes necessary.

In grave cases *Camphor* is an indispensable remedy. Most cases of cholera infantum will need it sooner or later. Drop doses of the tincture may be used, but the drug is best given hypodermically, as it may otherwise irritate the stomach. A good way to administer it by this method is in the form of camphorated oil, although personally I prefer the neutral solution of Camphor. This is of the same strength as the oil, namely 12½ per cent. In a young infant two or three minims will suffice; a year-old babe may receive five minims, while a child from three to five years old can safely be given ten to fifteen minims. If no result is seen within fifteen minutes, the injection may be repeated in a somewhat smaller dose.

If the body-surface becomes cold or the temperature subnormal, artificial heat must of course be applied. In cases of extreme depression I have at times seen beneficial results from hypodermoclysis, an ounce or more of normal saline solution being injected into the abdominal subcutaneous tissues with an antitoxin syringe. These cases are so grave, however, that often nothing will do the slightest good.

**Remedies.**—Although each case should be prescribed for individually, we can, nevertheless, classify our remedies to a certain extent in accordance with their applicability to the different varieties of infantile diarrhœa.

In simple intestinal indigestion *Nux vomica* is most useful. When given in time it will often cut short an attack. Hughes recommends *Lycopodium* when the condition becomes inflammatory. Teste speaks of the remedy as a specific in infantile enteritis.

Some infants are predisposed to diarrhœa without any apparent cause. In these cases there seems to be a slight catarrh, such as we find in the respiratory tract. *Pulsatilla* is very valuable here.

In acute gastro-intestinal intoxication *Belladonna* appears to be most frequently indicated, on account of the predominance of fever and nervous symptoms. Even in the later stages, when the bowel symptoms become more prominent, I have found *Belladonna* invaluable as long as fever and toxæmia were present.

In the diarrhœa accompanying teething, or those of a neurotic type, such remedies as *Aconite*, *Belladonna*, *Chamomilla*, *Gelsemium*, the *Calcareas* and *Pulsatilla* are the ones usually indicated. In fat-diarrhœa *Pulsatilla*, *Hepar* and *Magnesia carb.* have proved most useful in my hands.

In the ordinary cases of fermental diarrhœa and ileo-colitis I find *Podophyllin* 2x trit. a good remedy. *Mercurius vivus* 3x trit. follows if ulceration takes place. This is indicated by the continuance of the diarrhœa, moderate fever and abundant mucus in the stools. When the stools are grass-green *Mercurius dulcis* is better indicated. In the dysenteric type of colitis *Mercurius corrosivus* 6x is the chief remedy.

*Arsenicum*, *Ipecac* and *Veratrum album* are the most useful remedies in cholera infantum. *Veratrum* is Jousset's favorite. *Iris versicolor* will check the vomiting speedily, but leaves the bowels untouched, according to Richard Hughes. *Arsenicum* and *Veratrum* are often difficult to differentiate, especially in the beginning of the case. Under these circumstances there is no objection to alternating. I have found that when one of the apparently indicated remedies failed to act, prompt improvement followed on giving a constitutional remedy in alternation. Among these *Calcarea phosphorica* stands foremost.

Goodno cites a remarkable result obtained from the use of *Zincum* 6x trit. in a case of collapse with abolition of all reflex excitability, together with a cessation of vomiting and diarrhœa.

For a more detailed study of the therapeutics of diarrhœa the following remedies are appended:

*Aconite.*—In the beginning; high fever and restlessness; green mucus in the stools.

*Æthusa.*—Vomiting of large curds followed by prostration; projectile vomiting; convulsions.

*Aloe.*—Flatulence and rumbling in the lower bowel; large quantities of gas escape with stools.

*Antimonium Crudum.*—Tongue heavily coated white; disposition much changed, making the child disagreeable and fretful.

*Apis.*—Cerebral symptoms; suppression of urine; coma with hot head, dry skin; shrill cry.

*Argentum nitricum.*—Flatulence; watery stool, green, like chopped spinach; stool immediately after nursing.

*Arsenicum.*—Watery stools with vomiting and collapse; stools offensive, first greenish, later becoming dark; acrid stools; small mucous stools

with tenesmus; child nurses often but takes only a small quantity at a time. Similar to *Veratrum album*, but has more profound symptoms and pathological tissue changes.

*Belladonna.*—Green stools; abdomen distended and sensitive; face red; high fever. Where inflammatory symptoms are pronounced this is the most important remedy, especially if brain symptoms appear.

*Bryonia.*—Diarrhœa from change in weather; stools brownish; worse from motion; great thirst for large quantities of water.

*Calcarea carb.*—Stools light colored; sour vomitus and stool; useful in dentition, or in rachitic tendency; very fat; large belly.

*Calcarea phos.*—Child looks old; under-developed; stools greenish, thin and offensive; history of tardy dentition; belly flabby. A most valuable tonic both during the disease and in convalesence.

*Carbolic acid.*—When vomiting is a distressing feature, two or three drops in half glass of water, half teaspoonful every half hour. (Chas. D. Crank.)

*Camphor.*—Sudden appearance of choleraic symptoms; great prostration; collapse; apathetic state; body cold; will not remain covered.

*Chamomilla.*—Stools green with white particles, looking like "spinach and chopped eggs;" fretful; one cheek red, the other pale; child wants to be carried.

*China.*—Undigested stools; watery; yellow; much distention of abdomen with colicky pains; weakness; diarrhœa in hot weather. *China* acts as a tonic in protracted cases.

*Colocynth.*—Painful cases; pressure gives relief.

*Croton tiglium.*—I have frequently used this remedy with marked success in gastro-enteric infection where the stools are profuse and watery and of a yellow color. Every time the child nurses it has one of these movements, drinking apparently exciting peristalsis and bringing on a stool. The stool is shot out with great force and suddenness.

*Cuprum ars.*—Painful cases; choleraic and convulsive symptoms predominate.

*Dulcamara.*—Green, slimy, mucous stool, especially in summer, when the weather becomes cool; diarrhœa from dampness and cold.

*Ferrum phos.*—Dr. E. L. Clark has called my attention to the value of this drug in the early stage of ileo-colitis when there is high fever and blood-streaked mucus in the stool.

*Gamboge.*—Profuse watery stool; sudden, forcible ejection; rumbling and rolling; tenesmus after stool; diarrhœa in hot weather.

*Gelsemium.*—Diarrhœa from fright or emotional excitement; in children of nervous temperament; stool painless; involuntary; cream-colored.

*Hepar.*—Stools fœtid; white or clay-colored (fat diarrhœa); sour odor not only of stool but of the whole child; worse after eating or drinking, especially cold water; sour eructations; hepatic derangements.

*Ignatia.*—Prolapsus ani; sudden development of cerebral symptoms.

*Ipecac.*—Marked nausea and vomiting; stools grass-green; frothy; slimy; early stages of cholera infantum.

*Iris.*—This remedy has yielded excellent results in cholera infantum, and is also useful for other diarrhœas accompanied by vomiting. The vomited matter is sour, the dejections thin and tinged with bile.

*Jalap.*—Diarrhœa with colic; thin muddy, watery stools; flatulence; abdomen distended; child is good all day, but cries all night.

*Lycopodium.*—Intestinal indigestion; much flatulence; stools thin, brownish, mixed with lumps; putrid odor; child cries all day, is good all night.

*Magnesia carb.*—Sour diarrhœa with vomiting of sour matter; stools green, like scum on a frog-pond; watery; frothy; milk passes in undigested curds.

*Magnesia sulph.*—Dr. F. H. Pritchard * reports favorable results from the use of a weak solution of the sulphate of magnesia in the summer diarrhœas of children. His dosage is one-half to one grain dissolved in a teaspoonful of water. The indications calling for it are copious, watery stools, deficient in bile. He noted that as soon as the remedy had begun to act favorably the stools became bile-tinged. *Podophyllin* has a similar action.

*Mercurius.*—A predominance of mucus and involvement of the rectum calls for *Mercury*. The *Bichloride* is often preferable to the metal in dysentery, when there is much tenesmus and the stools are blood-streaked. *Calomel* has grass-green stools. The "never-get-done" feeling of *Mercurius sol.* is very characteristic, while the *Bichloride* has tenesmus of the bladder as well as of the rectum, and is the chief remedy in membranous colitis.

*Natrum sulph.*—Diarrhœa from damp weather; stool sudden; watery, gushing, sputtering; much flatus.

*Nux vomica.*—Acute intestinal indigestion; early, before inflammatory reaction has begun; stool composed of undigested food; prolonged straining. It corresponds to the stage in which Castor oil or Calomel is usually employed to clean out the gut.

*Podophyllum.*—Painless diarrhœa; stools yellowish or greenish; watery; prolapsus ani; diarrhœa during teething or in hot weather. As a routine remedy I believe *Podophyllin* 2x trit. to be most generally useful. When the stools are thin and greenish and expelled with considerable gas —an indication of fermentation—this remedy should be pushed until the normal yellow color reappears and the consistency is changed to a more pasty character.

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* *Hahnemannian Monthly*, November, 1900.

*Pulsatilla.*—Chronic intestinal catarrh; rumbling; watery diarrhœa; worse at night; no two stools alike.

*Rheum.*—Diarrhœa during dentition; sour pasty stools with tenesmus; whole child smells sour.

*Rhus tox.*—Dysentery; stools bloody, slimy, frothy; cadaverous odor; sharp tearing pains.

*Sulphur.*—Excoriating stools, worse mornings; marantic cases; child peevish; voracious appetite; lips very red; anus red and excoriated; unhealthy condition of the skin. "It is especially useful in dysentery after *Aconite* has removed the acute symptoms, when the tenesmus has ceased but blood is still discharged." (Bell.)

*Veratrum album.*—Vomiting and purging, latter most prominent; motion aggravates all symptoms; cold sweat on forehead. There is less prostration and thirst under *Arsenicum*, less restlessness and usually more pain, and when any doubt exists as to a choice between the two, *Veratrum* should receive the preference early in the case. When *Arsenicum* becomes indicated the patient has passed into a state of profound exhaustion, from which it is difficult to recall him.

**Dysentery.**—Aloe; *Apis*; Ars.; *Bapt.*; *Bell.*; Canth.; *Caps.*; *Colch.*; Ipec.; *Kali bi.*; *Lach.*; Merc. sol.; Merc. cor.; *Nux vom.*; Rhus tox.

**Hydrocephaloid.**—*Æthus.*; Apis; Ars.; *Bell.*; *Borax*; *Bry.*; Camph.; *China.*; Cupr.; Helleb.; *Ign.*; *Verat. alb.*; Zinc.

## Constipation.

The treatment of constipation is one of the most important subjects demanding the attention of the physician, not only because of the great frequency with which cases presenting this symptom call upon him for aid, but also because of the evil effects resulting from imperfect elimination by way of the bowels. We are all fully aware that the laity in their self-assumed knowledge of the importance of regular bowel action have carried their theories to an extreme, and that many constipated persons are such only because they have tinkered with themselves to such a degree that a natural movement is entirely out of the question.

The successful treatment of constipation demands a careful study of the patient, and an insistence that he follow the laws which his physician shall lay down. It will not do for him to rely upon a few careless directions as to diet and a formula for some laxative preparation. His entire method of living must be studied; his clinical history must be carefully unfolded; and then the physician is ready to correct the evils which exist—for evils there surely are. That we can succeed in getting our patients to follow our directions in all cases is beyond reason, when one bears in mind the many foibles of human nature. If the cure involves too much trouble, or if it causes a sacrifice of the invalid's hobbies, we can rest as-

sured that the patient will seek some one who will give more pleasant advice. All cases cannot be treated alike, because constipation can result from a very great variety of causes, and these, as I stated in my work on Diagnosis, may be either constitutional or local. Hence it is that cases of constipation must be treated on both constitutional and local principles.

There is a class of patients—a very large one in fact—who present a history of constipation of many years duration. They claim to be the victims of indigestion; in fact, they live in fear of dietetic transgressions. They profess to be unable to follow the ordinary rules of life. They are highly neurotic and under-weight. Biliousness is their self-styled condition. Many of them are brainy persons, and are classed with those who have attained success in life. One finds on investigation that they are well-informed concerning different formulæ for pills working on the liver. And when one is called upon to treat them, upon their livers he must work—at least he must profess to do so. I have always felt concerning such patients that their own silliness has brought its just punishment. They are to be treated in the same manner as we would treat ordinary neurotic dyspeptics, the directions for which have already been given in the section devoted to the treatment of gastric disorders. In other words, they must be better fed before they can be cured. In their craze for exact methods of feeding, they have gone to extremes, and have habituated themselves to a dietary which leaves but little fæcal residue; consequently there is nothing in the intestinal canal to stimulate its natural peristalsis. In dealing with these patients, we must take cognizance of their foibles, and govern the treatment accordingly. It will not do to be too precipitate, and at once order the full diet which they should take. Beginning with one article after another, we can gradually bring them up to what should be their normal standard. Unfortunately, their bowels have been inactive so long that we must aid nature by mild laxative measures and remedies. As most of them are sedentary and go but little in the open air, we must improve their nutrition by correcting these hygienic transgressions. The fresh air can be secured without difficulty, for they, one and all, recognize its importance; indeed, they will tell us that they are better for it. But the question of exercise is the difficulty. We are too prone to order exercise for these people indiscriminately, and I feel that in the majority of cases we are acting unwisely. As will be stated in another portion of this book, exercise is by no means an unqualified blessing for patients who are under-weight. Hence, I believe, that notwithstanding the general rule that constipated patients do not take enough exercise, patients of the class we are now considering do better on an excess of rest. If the nutrition changes are not sufficiently active for the quantity of food taken, then the lack of exercise may be compensated by general systematic massage. With increasing strength, these patients may be made to exercise more and more, until finally they become hale and hearty.

We find such patients among women also. They complain of menstrual irregularities, and it is a fortunate patient, indeed, who has not run the gamut of the pseudo-gynecologist's dexterous and ingenious operative procedures. The constipation is ever regarded as the cause of all ill-health instead of but one of its effects. If not this, it is traced to tubo-ovarian disease.

Then we have a class of patients in which the examination shows unequivocally that the foundation is a chlorosis. The treatment is not to be directed to the bowels at all, but to the condition of the blood. Such cases yield readily to the use of *Ferrum*, the methods for administering which will be fully described in the chapter on diseases of the blood.

There is a third-class of constitutionally constipated subjects, who may be described as lymphatic. They are slow in everything. They are nearly always over-weight. Such patients must be stirred up. They must be exercised.

It will thus be seen that I do not hold to the general view that exercise is a panacea for inactive bowels, and yet in suitable cases it makes all the difference between cure and failure. Persons whose occupations or preferences keep them in-doors all day long unquestionably fail to secure regular bowel action. With them the remedy is obvious. Note the effects of a vacation on these different classes of patients. The under-weight neurotic hies himself to the mountains or seashore, rests and drinks in the pure air, and without more-ado, his constipation is cured. The sedentary office man recreates in the same place, but exercises by walking, taking in the beauties of nature, and forthwith he is cured as is the other. Let the emaciated neurotic indulge in violent exercise—and I have known several of them to insist blindly that tennis is their salvation—and their unfortunate condition continues.

Should we decide exercise to be indicated, we must advise the patient as to its character. All exercises are not equally beneficial, and some are worse than useless. They should never be carried to the verge of exhaustion. The best exercise is walking in the open air. Rowing, tennis, golf, bowling, and Swedish movements are to be commended to those for whom they are suitable. If a person's time and means are limited, it will not do to recommend golf or the masseur ; if he has reached middle life or beyond, such violent exercise as tennis is certainly not suitable. Horseback riding, though much praised by physicians in general, is not very efficient. Bicycling will vary in its effects on different individuals.

Of in-door exercise those which develop the abdominal muscles are to be recommended. The patient may be ordered to lie flat on the floor, and then raise the body to a right angle with his thighs without assisting himself with his hands and arms. Then he should permit the body to return slowly to the horizontal position. This exercise may be repeated eight

or ten times morning and evening. Another exercise which may be practiced at any time is repeated retraction of the abdominal walls.

Regularity in habit is one of the first rules to be taught the constipated. Every day at precisely the same hour—usually after breakfast—should he seek the closet, and then endeavor to coax a stool. Some authors have advised positively against reading or otherwise occupying the mind at such times. I do not see that this makes any difference. Indeed, I can comprehend that with certain temperaments, the taking of the mind away from the fears of a disappointing result, by the perusal of the newspaper, will often help to bring an evacuation. The morning hour is generally selected because it is the time when persons have the time; after a breakfast, because the entrance of food into the stomach causes an increase of the intestinal peristalsis. While at stool, the urging should be gentle, and not too prolonged. If after a reasonable time failure results, the effort may be abandoned for the day. It may be necessary—in fact frequently is—to help the patient by various devices to be mentioned hereafter, as the suppository, the enema, or a mild laxative, like Cascara. Regularity of time and function in many persons becomes so exacting, that with some persons a stool can be secured only at some one hour of the day. If that time passes by, they must wait another twenty-four hours before they can secure a stool. They have what might be called "a time-lock on their bowels." This question of regularity in time for stool is one of the highest importance in preventing constipation, especially among girls. The public location of toilet rooms in the home or hotel, the presence of strangers, the development of a false modesty, are responsible for much ill-health from inactive bowels. To the above may be added the unreasonable suspicion of teachers who refuse the youths under their care the privilege of relieving themselves when nature calls.

Purgatives and laxatives should never be used in the treatment of habitual constipation excepting under the supervision of a physician. They serve at the best as a means for bridging over a period when the bowels are absolutely incapable of acting without help. If a patient is found to be possessed of "the pill habit," he must be rid of it at the earliest possible moment. Troublesome as it may be to go without his "dose," he must yield to the superior wisdom of the physician in this matter. A little sacrifice for a time will ultimately relieve him of the necessity of indulging himself in this direction. That laxatives are necessary in many cases I must admit, and will in a later portion of this article speak in extenso of the laxatives which are most efficient and the indications for their use.

Constipated subjects must abandon the use of alcohol, tea, coffee and tobacco, when conditions indicate that they are doing harm. Tea and alcohol I believe are never beneficial. In some cases the cup of coffee at breakfast and the morning cigar are unquestionably of value. At the same time,

I have seen cases in which the abandoning of these pleasures has without further assistance resulted in the radical cure of an habitual constipation.

Many patients are constipated because they have accustomed themselves to a highly nutritious diet, which leaves but little residue. This should be corrected by ordering a list of foods which contain considerable waste. In the matter of bread-stuffs, patients are especially liable to be remiss. It is a present day custom to consume a flour from which almost every vestige of waste has been removed. To this there can be no objection if the consumer can thrive on such a diet. He should, therefore, take such as Graham and rye, and corn breads. Butter, fruits, buttermilk, fats generally, honey, treacle, sugars, vegetables that contain much cellulose, especially cabbage, sauer kraut, salads, spinach, peas, cauliflower, asparagus, onions, celery, and tomatoes. Of fruits, apples, pears, peaches, cherries, oranges, and bananas are to be commended. Stewed fruits, as prunes, apples, peaches, etc., are very good as part of the evening or morning meal.

The substances which are to be avoided are those which leave but little fæcal residue, especially eggs and milk. Meats are permissible, but they should not be taken in such large quantities to destroy the appetite for more bulky nutriments. The question of cereals must be decided on the merits of the case in hand. Ordinarily, they may be given, but it is better that they should be taken at the end of the meal rather than at first, when they are liable to crowd out other and more important foods.

Various special diet lists have been formulated, but are open to the objection of proving monotonous when long-continued. I feel that it is much better to give specific directions as to the articles to be taken and those forbidden, excepting in the case of patients who are too blind to see for themselves. Of these diet lists the following have attained the most prominence :

Boas and Penzoldt recommend the following : 7 A.M.—A glass of cold water.

8 A.M.—A liberal breakfast, with sweetened coffee, a good deal of butter, honey, and Graham bread or pumpernickel, after which the patient should go to stool.

1 P.M.—Meat, a good deal of vegetables, salad, stewed fruits, farinaceous food, half a bottle of light wine (Moselle or cider).

8 P.M.—Meat, with a good deal of butter ; Graham bread, stewed fruit and beer.

10 P.M.—Before retiring, fresh or stewed fruit,

Wegele's diet list consists of : *Morning.*—200 grms. milk and coffee ; 30 grms. of butter ; 30 grms. of honey.

*Forenoon.*—300 grms. of buttermilk.

*Noon.*—200 grms. of bouillon ; 200 grms. of mutton ; 300 grms. of curly cabbage ; 200 grms. of plums ; 300 grms. of white wine or cider.

*Afternoon.*—300 grms. of buttermilk.

*Evening.*—150 grms, of meat ; 30 grms. of butter ; 300 grms. of stewed apples ; 230 grms. of Graham bread.

*After-evening meal.*—750 grms. of beer.

FRIEDENWALD AND RÜHRAH prescribe the following diet in chronic constipation :

6 A.M.—40 grms. orange juice.

8 A.M.—300 grms. milk with coffee ; 2 soft-boiled eggs ; 150 grms. Graham bread ; 40 grms. of butter.

10 A.M.—400 grms. cider.

12 M.—200 grms. broth with one egg ; 100 grms. steak ; 100 grms. carrots ; 100 grms. beans ; 150 grms. Graham bread ; 200 grms. stewed apples.

4 P.M.—400 grms. buttermilk.

7 P.M.—100 grms. scraped meat ; 150 grms. Graham bread ; 200 grms. stewed prunes ; 300 grms. cider.

9 P.M.—40 grms. figs or 400 grms. buttermilk.

The last two diet lists represent a high degree of nutriment, Wegele's providing 3,775 calories, and the other 3,525 calories.

A review of the above lists establishes my point—*i.e.*, that they will prove tiresome. It is better, therefore, to emphasize to the patient certain general principles respecting the efficacy of certain foods in constipation, namely, the coarse vegetables, the fats, stewed fruits, fruits generally, and the sweets, notably sugar, treacle, and honey. Figs are to be regarded as efficacious because, as stated by Lauder Brunton,* they possess three kinds of laxative properties : (1) The mechanical irritation due to the altogether indigestible seeds ; (2) the stimulus given by the vegetable salts contained in the fig ; and (3) the stimulus given to the bowels by the sugars.

The full role of water in the causation and treatment of constipation must be considered. In the first place, there are many cases in which the main difficulty seems to reside in the hardness of the fæcal masses. A study of the patients presenting this phenomenon ofttimes shows that they are very sparing in their indulgence in liquids. Such persons are usually relieved very promptly if they take not less than a full glass of water on retiring at night, and a similar quantity again on rising in the morning.

It sometimes happens that the water of a community is of hard quality —*i. e.*, it contains lime derived from the soil. This water, whether employed for cooking or drinking purposes, is conducive to constipation. When a condition of this kind exists, patients must be ordered to drink and use, for culinary purposes, soft water.

A very valuable adjuvant in many cases of atonic constipation is mas-

* *On Disorders of Digestion, Assimilation,* etc., p. 227.

sage. To be successful, however, it must be applied by a skilful manipulator. Mere rubbing will not do. When the patient is neurasthenic, manipulations of the entire body should be combined with the abdominal massage. The expense attendant upon this line of treatment will place it out of reach of many people. For them, we have a fairly reliable substitute in what has been called cannon-ball massage. A three to five pound shot * is covered with chamois leather. Each morning and evening while the patient is lying in bed, he rolls the covered shot over the abdomen for a period of ten minutes. The movements are made to follow the course of the large intestines.

Fenton B. Turck, of Chicago, has devised a method of what might be called internal rectal massage. He has devised a series of rubber bags. One of the proper size is selected, and inserted into the rectum. It is then rapidly distended with air, and as rapidly emptied. This process stimulates the rectum and reflexly the balance of the large intestine. The treatment must be carried on by the physician. Turck claims excellent results from it.

When there is considerable atony of the abdominal walls, as in the case of women who have gone through several pregnancies, much benefit may be derived from the application of a suitable abdominal binder. In the same class of women, constipation may result, as has been pointed out by Brunton,† from relaxation of the pelvic floor. The fæcal masses as a result accumulated in the rectum, and the floor of the pelvis is so loose that it will not press them forward so as to evacuate them through the anus. To relieve this condition, the patient is directed to place the fingers just beside and a little in front of the coccyx, so as to support the pelvic floor and give a little pressure to the fæcal masses "so that they may pass forwards through the anus in very much the same way as the accoucheur would support the head during parturition."

Another method of overcoming the relaxation of the pelvic floor is that originally suggested by Williams, and endorsed by Brunton, Nothnagel and others. It is attention to posture while at stool. Uncivilized races crouch while at stool. The civilized sit upon what is practically a chair with an opening in it. The crouching position is advised in some cases because it stretches the pelvic floor and affords support to the fæcal mass as it is driven backwards by the action of the abdominal muscles.

This is a practice which will ruffle the æsthetic sensibilities of most patients, but especially women, and is not likely to prove practicable for that reason. The nearest that they will come to it, will be to use the *pot de chambre* instead of the water-closet.

* I have always experienced difficulty in getting these shot. For awhile, I had no difficulty in finding them in sporting goods stores. The increased demand for them has led to their being kept in stock by surgical supply houses.

† *Ibid.*, p. 231.

Enemata are very necessary measures in most of the obstinate cases; but they must be used with discretion. If given too frequently, or in too large quantities, they not infrequently produce an intestinal atony by reason of the undue stretching of the intestinal walls. In all cases of habitual constipation in which the hygienic measures fail to produce a stool after forty-eight hours of waiting, an enema is the most reasonable device for exciting bowel action. When starting in with them, we must observe the common rule "The simplest is the best"; and so we should prescribe a plain warm water injection. As a rule, one-half pint may be employed at first. If this fails, a larger quantity may have to be given; but the maximum quantity should never exceed one quart. When plain water fails to excite the necessary peristalsis, we may prescribe a mixture of glycerin and water in the proportion of one to three. When the rectum and sigmoid are clogged with fæcal masses so as to make a mechanical obstacle to a stool, an injection of one-half to one pint of olive or cotton seed oil will prove very efficient. If it fails, then one must have recourse to the methods to be advised hereafter in the management of fæcal impaction. If the enemata at ordinary temperatures fail to have a sufficiently stimulating effect, they may be made more active by administering at a temperature of 50° F.

When the retained fæces are of normal consistence, and the main difficulty is the poor expulsive force, enemata of plain glycerin are in order.

The glycerin excites very active peristalsis by withdrawing waters from the tissues. It should be administered through a small bulb or piston syringe without any admixture of water. Pronounced urging to stool starts in within two or three minutes after the injection. Glycerin suppositories are regarded by some patients as more convenient than the injections. They are not as efficient, however, probably because of the smallness of the dose administered.

When, for any reason, it is deemed undesirable to administer a purge by the mouth, a very active clearing out of the bowels may be secured by what is generally known as the compound purgative enema, the formula for which is as follows:

| | | |
|---|---|---|
| Magnesium sulph., | . . . . . | ℥ij. |
| Ol. terebinth., | . . . . . | |
| Glycerin, | āā | fl. ℥ss. |
| Aq. bullient., | *q. s.* ad | fl. ℥iv. |

S.—Give as an enema at one dose when desired to produce an evacuation.

This compound enema is not suitable for repeated action. It is generally used by laparotomists to clean out the bowels prior to operation. I have used it when ordinary enemata have failed to work and I wished to secure prompt action.

The successful action of enemata demands careful attention to technique.

It is often surprising to note how regularly members of the laity fail to produce a result when a first-class nurse succeeds at the first trial. In fact, I do not think I exaggerate, when I say that the lay nurse administers the enema inefficiently in most cases.

The best syringe is that known as the fountain syringe, which consists of a reservoir, a long rubber tube, and a proper nozzle. The reservoir should be capable of holding from two to three pints. When administering the enema, one must have a definite idea as to his objects. If he wishes to inject but a small portion, and to act upon the rectum only, the nozzle need be inserted but a short distance. If, on the other hand, he desires to stimulate the colon and give a large enema, it is necessary to throw the fluid well up into that cavity. Under such circumstances, he cannot rest satisfied with introducing the fluid into the rectum, because he will so distend its cavity as to excite an immediate tenesmus, which will result in a failure of the desired object. On the contrary, he should use as a nozzle a long, soft, colon tube, which should be inserted well up into the colon. To prevent its end from being doubled up in passage, the fluid should be flowing during introduction. This keeps the point of the tube from being caught against any of the folds of the mucous membrane. The pressure employed should be just sufficient to accomplish the object; no greater. It is to be regulated by the height of the reservoir. The patient should occupy a lying position on the left side with the hips somewhat raised. The recommendations that enemata be administered in the evening to excite a stool the following morning is not practical in my experience, for in most instances—practically all in fact—a movement is excited by them within a comparatively short time after their administration.

All cases of habitual constipation should be examined for the presence of constitutional or local disease. Thus, if we find that expulsive power is damaged by rheumatism of the abdominal muscles, the case must be treated for a time at least as one of muscular rheumatism.

The rectum must be searched most carefully for anatomical changes, notably hæmorrhoids, fissures, and ulcerations. Treatment of these brings about a brilliant cure.

Much has been said concerning spasm of the sphincter ani as a cause of constipation. The remedy recommended—divulsion of the sphincter under nitrous oxide anæsthesia—undoubtedly cures many cases; but this does not prove the case to have been due primarily to sphincteric spasm. It is a fact that several days after a proper stretching of the sphincter ani, that muscle has about regained its usual vigor, and yet the constipation is cured, It is more than probable that some slight local lesion has occasioned the spasm of the sphincter; that the stretching of the latter cures the hæmorrhoids, fissure, ulcer or other lesion; and then the spasm of the sphincter disappears and the constipation is cured.

When constipation is dependent upon dehydration of the body, as in diabetes and excessive sweating, the treatment must be directed to the primary cause. From a dietetic standpoint we may find ourselves in a dilemma; any recommendation we may make seems to be strongly contra-indicated by one of the conditions present. Under such circumstances, we should ignore the constipation and direct our measures to the removal of its causes. Constipation from excessive sweating is rarely of much clinical importance. It may be corrected by free drinking of water. It rarely continues longer than the excessive exertion or the hot weather which produces it.

Once in a while, a case of constipation is encountered in which the functional activity of the intestines is due to imperfect circulation from heart disease, and this, too, without the heart giving any evidence of the disease to the patient. Of course, constipation as one of the symptoms of ruptured compensation is more common. The treatment in any case is that of the heart, rest and the cardiac remedies.

Some cases of pelvic disease in women when attended by pain restrain bowel action. The unfortunate part of such cases is that the constipation not infrequently reacts to intensify the genital disorder, thus establishing a vicious circle. These cases must be treated with careful attention to both phases of the case.

Electricity may be regarded as an uncertain adjuvant in the treatment of constipation. Perhaps if it was more frequently used we might come to regard it with the high favor in which it is held by electro-therapeutists. Many remarkable cures have been reported. My own personal experience, which has been limited to but few cases, leads me to make it but one of the auxiliary methods of treatment, and not as a treatment *per se*. The best method of treatment is that in which the negative electrode is of the douche variety, and is placed within the rectum. A large, flat positive electrode is placed upon the abdomen or sacral region. The rectal douche electrode is necessary for internal application, because by means of it any possibility of damaging the rectal mucous membrane by electrolysis is avoided. The galvanic current should be employed, and free from interruptions. The seances should be from ten to twenty minutes each, and should be repeated on alternate days. Under no circumstances should the current be sufficiently strong to be uncomfortable.

Despite the most careful attention to hygienic details, we will frequently find it necessary to resort to laxative drugs as a temporary makeshift. In cases which have continued for many years, and in persons who are so advanced in life as to make it impossible to establish a natural regularity of function, we may find it necessary to continue the administration of laxatives for an indefinite period. Of these laxatives, *Cascara sagrada* is unquestionably the best. It differs from all other drugs of its class in

that it exerts a tonic action on the intestines. This is well attested clinically by the fact, that patients who have been obliged to take the drug find that they can get along with smaller doses as time progresses. Unless given in extravagant doses, it is never followed by secondary constipation. The preparations in common use are the fluid extract (dose, 10 to 20 minims), and the solid extract (dose, 1 to 3 grains). Cascara has been criticized because of its liability to produce griping. My own experience is positively against any such contention. The discrepancies in experience can only be explained by the probability of many spurious preparations of the drug having been placed on the market. People vary greatly in their susceptibility to its action. Thus, some get an easy movement in the morning following a 1 grain tablet of the solid extract the night before; while extremely obstinate cases may demand as much as 5 grains, three times daily, before securing a satisfactory result. My standard in patients about whom I know nothing from personal experience, is the single dose of 3 grains at night; or 2 grains three times daily. While not advocating the routine use of Cascara, I must express complete faith in its freedom from unpleasant effects. I have one patient who has taken it regularly every night for nearly forty years, and requires no larger quantity now than he did in the beginning. He has used the drug with reason, varying his evening dose according to the condition of the bowels on the morning of that day. When the case is one calling for *Nux vomica*, I administer in conjunction with the Cascara in the same tablet, from one-eighth to one-quarter of a grain of extract of Nux vomica.

*Aloin* should never be used as a laxative excepting in conjunction with other drugs. It is a medicine having a slow action, and should not be prescribed for long periods of time because of the production of intestinal atony. Its action is mainly on the large intestine. It produces considerable griping; hence, should be combined with an antispasmodic, of which Belladonna is representative of the type. Hare gives the following formula:

| | |
|---|---|
| Aloes socotrinæ, . . . . . | gr. xx, vel. xl. |
| Extract nucis vomicæ, . . . . . | gr. iv, |
| Extract physostig., . . . . . | gr. iij. |
| Extract Belladonnæ, . . . . . | gr. iv.—M. |

S.—One pill at night or night and morning.

Another formula which is very popular with the profession is a pill containing 1/8 grain each of Aloin, Extract of Belladonna and Extract of Nux vomica.

The addition of the Nux vomica is to overcome the atonic effect of the Aloes; the Belladonna acts to prevent griping; and the Physostigma stimulates the unstriped muscular fibres of the intestines.

Purges and cathartics finds no place in the regular therapy of consti-

pation. Nevertheless, there may come a time when one must secure a bowel action. We may then prescribe a dose of Castor oil (℥ss), or the compound cathartic pill, Magnesium sulphate, etc. Cases in which these drugs are required are very rare. Excepting among patients who have been greatly abused by the previous administrations of purgatives, they are probably never necessary as part of the treatment in habitual constipation.

Of the curative remedies in constipation, *Nux vomica* and its alkaloid, *Strychnia*, unquestionably lead the list. The characteristic indications are: Frequent fitful urging to stool; morning headache; coated tongue with bad taste in the mouth in the morning; cases that have been abused by overdosing with cathartics and purgatives; high living and excessive eating.

*Bryonia* is an important remedy in constipation dependent upon deficiency of the intestinal secretions. The stools are hard and brown. Ultimately, there supervenes an inactivity of the rectum. It is the remedy for the constipation of hot weather. The patient is often of a rheumatic constitution. He complains of thirst for large quantities of water; great dryness of the mouth and tongue.

*Opium* is the remedy in constipation due to marked intestinal atony. The stools are dry and hard, from long retention and absence of the normal secretions. It is especially adapted to cases of constipation associated with oöphoritis or other painful pelvic disorders. Concerning this drug there have been very interesting observations made respecting the uncertainty of the dose which will prove efficient. While many cases are cured by the dilutions, others require material doses. When the constipation is dependent upon the inhibitory influence of pelvic pain it is not unnatural to expect that a moderately small dose of the crude drug, like one or two minims of the tincture or one thirty-second of a grain of morphia, will be required. In the constipation attendant upon lead colic it may be necessary to administer as much as one-fourth of a grain of Morphia. Lauder Brunton makes a very interesting observation, which I shall quote: "The bowels were obstinate and my friend prescribed half a grain of Opium so as to lessen the pain which she was suffering from an inflamed ovary. To his astonishment, she got after the Opium a natural evacuation, which she had not had for a long time before. Following on this, I made a somewhat extensive trial amongst my out-patients at St. Bartholomew's Hospital, but the results I got were very uncertain. In some cases it acted, in others there was no action at all. It is quite possible—indeed, it is quite probable—that some of the cases were unsuitable for it. In one private case I did not know exactly what dose to give, and I prescribed one minim of the tincture of Opium every night. A week afterwards I had a report from the patient's husband to say his wife was no better. I replied, 'Double the quantity.' In a few days the report came, 'She is rather worse.' I then wrote to say: 'Give her half the first dose.' Three or

four days later I had a letter to say that the last medicine acted well, if anything a little too violently. I have never been able to make up my mind as to whether this result was due to suggestion, like the aperient action of a bread pill, or was actually due to the action of the drug. I am inclined to think it was due to the action of the drug, because the suggestion had been clearly applied to the mind by the one minim and the two minims, and these did no good at first, and later did harm, while the half-minim caused an active evacuation of the bowels. At first it seems an absurdity to ascribe this action to the Opium, but when one comes to think of the complex nature of the innervation of the intestine, where there are at least two different systems of nerves—one which stops movements in the intestine and one which increases movement—one sees that it comes to be simply a question of shifting the action of a very delicate balance."

*Hydrastis Canadensis.*—This remedy is indicated in cases of constipation in which the stools are hard and are coated with mucus. Special symptoms are a sensation of goneness in the epigastrium, frontal headache, sour eructations and hæmorrhoids. Like Nux vomica, is useful in cases associated with chronic gastric catarrh, and in persons addicted to the use of purgatives.

*Collinsonia* is useful in constipation associated with hæmorrhoids. The stools are dry and hard, as in Opium, but differ from that remedy in that they are of a light color. The patient complains of sticking pains in the rectum.

*Sepia* is the remedy for constipation occurring in women who have utero-ovarian disease. There is urging as if there was some foreign body in the rectum. The patient may complain of a constant full feeling in the rectum, even after stool. Unquestionably, there is an inactivity of the rectum, for the patient has difficulty in emptying it, even though the fæcal masses be soft or of normal consistence.

*Sulphur* is so prominent a remedy in the treatment of habitual constipation that many practitioners use it as a routine remedy in alternation with Nux vomica. It is also much used by old-school practitioners. Sir Andrew Clark years ago advocated its use, but in material doses. There is frequent ineffectual urging to stool with hæmorrhoids; or constipation alternates with diarrhœa.

The number of remedies that may be indicated in habitual constipation is large. The above are the ones most commonly used. In addition, may be mentioned *Alumina*, *Anacardium*, *Conium*, *Graphites*, *Lycopodium*, *Magnesia mur.*, *Phosphorus*, and *Plumbum*.

## Constipation in Infants.

By C. Sigmund Raue, M.D., Clinical Professor of Pædiatrics in the Hahnemann Medical College of Philadelphia.

Constipation is one of the commonest conditions encountered by the physician in his practice among children, and its cure can only be accomplished by a rational understanding of the causes upon which it depends. Normally, a young infant should have from three to four bowel movements daily ; after the second or third month the number usually decreases to two, and after the first year one daily movement may be looked upon as sufficient.

In the vast majority of cases some dietetic error may be discovered as responsible for the condition, although it should not be forgotten that infants are naturally predisposed to constipation on account of the relatively great length of the intestinal tract and the exaggerated curve of the sigmoid flexure. The musculature of the intestines is relatively feeble, and for this reason long-continued impaction of the gut with fæcal residue and overdistention from fermentative processes may lead to permanent dilatation of the colon. It is a mistake to believe that fæcal impaction is uncommon in young children, and wherever abdominal symptoms are encountered this is one of the first conditions to be looked for.

Again, habit must also be taken into consideration, for it plays a prominent role in the etiology of constipation in children as well as in adults. A great many cases are the direct result of bad training, and in some instances I have become convinced that the child was simply too lazy or indifferent to move its bowels. For this reason, constipation is so common among the mentally deficient.

As to diet, in the first place the infant may appear to be constipated when in reality it is not getting sufficient food, or the same is so deficient in solids that there is not enough fæcal residue in the intestinal tract to produce the usual number of evacuations.

It is generally taught that deficiency in fat in the food is the paramount cause of constipation, and while this is true to a certain extent, nevertheless much harm has been done by the indiscriminate application of this principle. We are now fully aware that the increase of fat in a milk formula beyond a certain percentage may not only aggravate the constipation, but also induce a train of serious general symptoms resulting from disturbed metabolism and fat dyspepsia. Personally, I believe that a judicious increase of proteids is more important than an increase in the fat, excepting in such cases as have been on a diet with distinctly low fat percentage. It is well to remember that the percentage of fat in a formula should never be increased beyond 4 per cent., and that, as a rule, 3 per cent. of fat is sufficient for the requirements of the organism.

The substitution of maltose for lactose in the food will also act beneficially in many instances in relieving constipation. Oatmeal water, used as a diluent for the milk, exerts a laxative effect. A drink of sugar water between feedings will often give good results.

In the case of older children we have more latitude in the regulation of the diet. Some fruit and a glass of water before breakfast should be insisted upon. The amount of meat should be restricted, and the eating of cereals, vegetables and fruit, either raw or stewed, should be urged. Graham bread should be substituted for wheat bread. A cereal coffee, such as Postum, used as a beverage, has been of decided value in some of my cases. A useful adjuvant in the treatment of these cases is a dessertspoonful of good olive oil mixed with an ounce of unfermented grape juice taken twice daily, one hour after meals.

*Local conditions*, such as fissures of the anus and polypi, must be sought for. The systematic use of *enemata* is of decided value in habitual constipation, and their employment is especially indicated when the stools are large and hard. A gluten *suppository* may also prove valuable in establishing the habit of evacuating the bowels at a regular time each day.

*Massage* is of decided value in infants to stimulate peristalsis and assist in the dislodgment of fæcal accumulations.

The remedies most frequently useful are *Bryonia*, *Hydrastis*, *Nux vomica* and *Sulphur*. Other remedies which may be called for upon special indications are *Alumina*, *Calc. carb.*, *Graphites*, *Lycopodium*, *Mercurius vivus*, *Opium*, *Plumbum*, *Phosphorus*. If resort must be had to physiological means we should avoid the use of drugs which are either harmful or which only intensify the condition.

*Castor oil* should only be used in acute conditions in which a rapid emptying of the bowels is imperative.

*Hydrate of magnesia*, put on the market as "milk of Magnesia," may be added to the milk in place of lime water, and thus serve the double purpose of an alkali and mild laxative. One drachm added to the twenty-four hours' amount of food will usually be found sufficient. Older children may take half a teaspoonful in water at bedtime.

The general and indiscriminate use of the popular syrups (proprietary), which contain either senna or Rochelle salts, is to be decried. *Senna* is perhaps the least harmful of the various laxatives, and in combination with carminatives and Licorice it is readily given to children.

*Ox-gall* is a powerful cholagogue, and may be given in one grain chocolate-coated tablets in cases characterized by deficient biliary secretion.

*Bryonia.*—Stools large and dry, as if burnt.

*Graphites.*—Stool consists of small balls bound together by mucus. Fissure ani; eczema ani; fat babies with skin eruptions.

*Hydrastis.*—Constipation due to atonic dyspepsia and portal congestion;

mucous colitis; catarrhal affections in general; loss of appetite. "Constipation after purgative medicines." (Goodno.)

*Lycopodium.*—Flatulent distention of abdomen; red sediment in urine, staining diaper. Painful contraction of anus during stool.

*Nux Vomica.*—The child strains and grunts but passes little or no stool; the abdomen is distended and hernia is apt to result from the constant straining.

*Sulphur.*—Habitual constipation with general malnutrition; anus sore after stool; prolapsus ani and hæmorrhoids; alternate constipation and diarrhœa.

## Mucous Colitis.

(***Membranous enteritis; colica mucosa; mucous colic.***)

A perusal of the literature bearing upon the treatment of membranous enteritis, so-called, is far from satisfactory. One author gives his reader a most pessimistic view of the outlook; another teaches the reverse. Again, agreement as to the methods necessary to secure the desired result are by no means the rule. Even the directions that are given are of such a vague character that one is at times at a loss to determine just what plan of treatment the author does advocate. Such discrepancies must have a reason, which according to the writer's experience is found in the fact that the cases of mucous colitis differ greatly in their clinical features. The typical cases present well-defined hysterical or neurasthenic phenomena in addition to the intestinal symptoms; in the remainder, one observes that one or the other set of symptoms predominate. It is obvious that one must regulate his treatment according to the general or special characters of each individual case.

The indications then involved in the treatment of patients with mucous colitis include attention to the nervous system, the maintenance and improvement of general nutrition, and measures directed to the bowels. The first of these indications is to be met by a course of rest treatment, when affairs are sufficiently severe to demand it. The details of this treatment will be found in the sections of this work devoted to the treatment of hysteria and neurasthenia. How rigidly the different factors should be enforced must depend upon the prominence of the different elements entering into the "nervousness."

The treatment directed to the maintenance of nutrition and the state of the bowels go hand in hand. They are practically identical. Considering the subject first from the latter standpoint, it has been pointed out by most authorities that attention to the constipation is most important if not a necessary factor in the treatment. To secure regular action, it has been popular practice to order a diet that would prove useful in the management of ordinary cases of chronic constipation. It remained for von Noorden to go even farther than this, and propose a plan which he first put into practice about

fifteen years ago, said plan consisting of feeding the patient on coarse articles of food, such, for example, as would leave a large fæcal residue. This plan is in strong contrast with the one previously prevailing, which was to administer food that was as little irritating as possible. To quote von Noorden:* "The ordinary diet that it was customary to give consisted of milk, milk-dishes, gruels, white bread, toast, zwiebach, light dishes made from flour, delicate varieties of meat, purees of stewed fruit and vegetables. . . . The diet should consist of bread containing a large proportion of husks (Graham bread), in quantities of 250 grammes a day or more, in addition as great a variety as possible of leguminous plants, including the husks, vegetables containing much cellulose, fruit with small seeds and thick skins, like currants, gooseberries, grapes; besides large quantities of fat, in particular of butter and bacon, were found to be useful. On a diet of this character, the stools become abundant and, at the same time, soft, so that the motions did not irritate the bowel mucosa any more; consequently the reflex secretion of mucus also ceased very soon." It is not expected by the author that the fæces will, in every case, speedily assume the proper condition for an easy evacuation; so in many instances it is advisable or even necessary to supplement the action of the coarse food by the administration of mild laxatives or enemata of large quantities of olive oil. Such measures are, however, only required during the early days of the treatment, and can be soon suspended with the relief of the local condition. As an example of the daily diet of his patients, von Noorden presents the following schedule:

*In bed, at 7* A.M.—Three-tenths of a liter of milk and cream (two parts of milk and one part of thick sweet cream); then usually a rub with moderately cold water.

*At 8* A.M.—One-quarter of a liter of Kissengen or Homburg Elizabeth water.

*At 9* A.M.—Three-tenths of a liter of the milk cream mixture or of thin tea or coffee with much cream; sometimes, too, cocoa prepared with cream or butter and sweetened with sugar or milk. In addition, 50 to 70 grammes of coarse bread containing much cellulose, and 30 to 50 grammes of butter.

*At 10.30* A.M.—If necessary a massage of the intestine or hydrotherapeutic treatments of different kinds, sometimes electrization of the colon.

*At 11* A.M.—Soup made from leguminous plants boiled with bacon or Westphalia sausage; in addition, Graham bread with plenty of butter. Also a glass of breakfast wine or a small glass of brandy.

*At 1* P.M.—Some meat dish, as much as wanted. In addition, vegetables of different kinds, boiled or baked potato with butter. Fruit with coarse skins and large seeds, as currants, gooseberries, cranberries boiled or a pound of grapes. One-half pint bottle of light young Moselle wine.

* *Membranous Catarrh of the Intestines*, p. 41 *et seq.*, 1903.

After eating, rest in bed for an hour and a half with hot applications to the abdomen.

*At 4* P.M.—A light lunch similar to the breakfast at nine o'clock. Then a walk of one-half to two hours.

*At 7* P.M.—Supper like the dinner; sometimes, too, junket, or fruit soup. In addition, 50 to 70 grammes of Graham bread with plenty of butter.

*At 9* P.M.—Three-tenths of a liter of the milk cream mixtures as in the morning.

The quantity of cream taken by the patient in following the above schedule amounts to one-half liter (a trifle over a pint), and the daily quantity of butter to 230 grammes (nearly eight ounces), and the daily quantity of Graham bread to 250 grammes (about half a pound). It will thus be seen that these articles together with the others mentioned on the list must provide for an unusually large quantity of nutriment. When the patient is treated in a sanitorium where strict discipline is maintained, it is the best plan to enter upon this strict diet at once; when conducted at home, it is a wise plan to break into the new routine gently, two or at most three days being occupied in reaching the typical dietary. At first the patient finds some difficulty in following out the schedule, and in some few instances there is a little suffering, which soon ceases to be a factor of any importance.

The result of this plan of treatment is to cause the disappearance of all mucus from the stools in the course of a week. After three or four days, the quantity passed is comparatively unimportant. In nearly half the cases, the production of mucus ceases at once. At the end of four weeks, the patient is generally ready for a return to what may be called his normal dietary. In laying down rules for future conduct, the old illness must be borne in mind. So it may be regarded as advisable that the diet be continued "coarse" as far as may be convenient, while the free use of butter must be insisted upon. Of course, the large quantities advocated in the schedule already quoted are not to be maintained. The value of this treatment is shown by the fact that 79 per cent. of the cases treated thus by von Noorden, complete recovery ensued; relapses occurred in but 13.1 per cent. of these. Failure followed in but 5.2 per cent.; certainly, a remarkable showing!

Other authorities differ from von Noorden respecting the allowance of coarse food, and their failure to push the fats to the extent advised by him. That they entertain a high regard for the free ingestion of easily digested fats is evident from their writings, but they seem to lack the courage of their convictions in putting their ideas into practice to the utmost degree.

All agree also in the value of keeping the bowels open daily. For this purpose, there is no better evacuant than Cascara, the dose of which

will range from one to three grains of the dried extract three times daily, according to the result secured.

The weak point in the von Noorden treatment is its apparent neglect of the neurotic element. This is admitted by its discoverer, for he refers to the much better results obtained when the treatment is conducted in an institution and the patient is isolated from family and friends. One-half of his failures occurred in persons who were treated in their own homes. One must feel, therefore, that the treatment should, whenever possible, be carried out either in a hospital or a sanitorium, where the sick-room organization is of the best. Failing to gain this point, the patient should be placed in the care of a tactful nurse well versed in the management of the vagaries of the neurotic invalid.

Before von Noorden first proposed his plan of treatment, cases of mucous colitis were cured by other methods, though the results were not so regularly successful. The most prominent of the older treatments is that of Kussmaul and Fleiner, which consisted of irrigation of the colon by oil. The technique of the injections is an important element to their success. There is no reason why they should not be used as an auxiliary of the von Noorden treatment. From eight to sixteen fluid ounces of olive oil should be warmed to the temperature of the body and injected high into the colon. This is done in the evening, and the patient is instructed to make every effort to retain them until morning. As a rule, no difficulty is experienced in this direction, and the patient usually passes the night in comfort. Should he be unable to tolerate this quantity, as small a quantity as five ounces should be injected, and after this has been tolerated for a time, the quantity may be increased night after night until the maximum of sixteen ounces is reached. These injections should be practiced nightly for three weeks; then on alternate nights for another three weeks, then twice weekly for four weeks; and finally once a week for five or six months. No satisfactory explanation of the rationale of the oil treatment has been offered. Einhorn suggests that "the favorable effect may perhaps be explained by the circumstances that by means of the oil, the intestine is not left in an empty condition during the night, and that thereby a spasmodic contraction is avoided, which must be regarded as one of the principal factors in the formation of mucus."

Irrigation with normal salt solution is to be regarded as valuable, both during the paroxysms and in the inter-paroxysmal period. Very often a single high injection of a moderately large quantity will put an end to the attack. Better results will be secured, as a rule, if the precaution is taken, to give the patient a small dose of Morphia hypodermically (gr. $\frac{1}{8}$). Besides, the patient will experience no pain from the procedure.

During the paroxysms the patient must be kept in bed. Hot applications afford very satisfactory means for relieving the pain in most cases.

An effort should be made to secure free movements of the bowels as soon as possible. If the enemata fail, then one should give a brisk purge, Calomel in fractional doses being the most satisfactory.

The medicinal treatment of cases of mucous colitis must be conducted on a symptomatic basis. This is evident when one considers the numerous neurotic phenomena attendant upon the disease. As to specific remedies, we have none. Those mentioned in homœopathic literature, as *Iodine*, *Bromine*, *Hepar* and *Kali bichromicum*, and others recommended because of their relationship to croupous inflammations, cannot have any curative influence excepting in individual instances, for their pathogeneses do not correspond to the pathology and symptomatology of mucous colitis. In the way of internal medication, we would prefer to ignore the condition of the bowels entirely and direct all our attention to the general health of the patient, especially as regards the condition of the nervous system and the association of anæmia.

Appendicostomy has been recommended as a remedy for cases which resist the ordinary medical treatment as above outlined. The procedure is a rational one, and should receive more attention than has been accorded it. The idea of the operation is to furnish a means by which the large intestine can be irrigated successfully. In the few cases in which it has been tried at the Hahnemann Hospital, the results have been brilliant. The literature contains reports of such few cases that we can say nothing of value as to statistics and cures. There is no reason why the patient's life should be endangered to any great extent, for the operation wound does not deal with septic tissues. The greater danger lies in postponement of operation until the patient has become so greatly weakened that slight shocks are capable of precipitating a fatal issue. I believe that appendicostomy has a great future in the treatment of mucous colitis.

## Intestinal Hæmorrhage.

(***Enterorrhagia.***)

So diverse are the causes of intestinal hæmorrhage, the treatment of this symptom becomes a complicated matter. It is easy enough to institute such measures as seem reasonable in the control of the bleeding, but owing to the usually inaccessible location of the bleeding point, it may be considered a piece of good luck if one's efforts should result successfully. As in the case of hæmorrhage from other localities, absolute mental and physical rest is the first desideratum. The patient must be put to bed and kept there until several days following the disappearance of all signs of blood from the stools have elapsed. All feeding by the mouth should cease. If the patient's nutrition prior to the onset of the bleeding has been good, this enforced starvation amounts to nothing other than its inconvenience. If, on the other hand, his general condition is below par, it is good

practice to start in with rectal alimentation after the lapse of two or three days. If the patient is thirsty, he may be permitted small quantities of water, though even this should be avoided if at all possible. The craving for water can in a measure be compensated by hypodermoclysis and rectal enemata. The latter should be administered at blood heat and in small quantity in order not to excite intestinal peristalsis.

Hæmorrhage from the intestines as from other localities must be regarded as a surgical lesion, and as such must be treated on surgical principles. Mechanical measures are certainly the best for controlling it whenever such are available. In the case of bleeding from an inaccessible point in the intestines, one can apply the principles in but an incomplete way. We have as one indication for fulfilment the splinting of the intestines. This may be best secured by the administration of Opium. One grain of the extract or of Svapnia may be given every hour until the patient goes to sleep. Usually two doses accomplish this, when the drug need no longer be repeated at short intervals. After that, it may be given in the same dose, but four times in the twenty-four hours, never more. Even then it should not be given unless the hæmorrhage continues.

The value of the ice-bag or Leiter's coil to the abdomen is of debatable value. Leube and Nothnagel both condemn the application of cold. They assert that the temperature change occasioned thereby does not penetrate sufficiently to influence the bleeding point, and the effect of it on the intestinal peristalsis is to increase rather than to diminish it.

The administration of astringents is likewise of doubtful value. When one considers the enormous surface of the intestinal mucous membrane, he can readily appreciate how small is the chance of any astringent administered by the mouth reaching the bleeding point in quantities sufficient to act thereon. Still, if one is inclined to direct his treatment in this way, he may employ *Tannigen* in doses of ten grains every one or two hours, or the Subnitrate of Bismuth in doses of one drachm three times daily. Other astringents that have been recommended to be administered by the mouth are Monsel's salt in pills of three grains every half-hour and Tannic acid in large doses. Inasmuch as the Tannic acid of Tannigen does not become active until the drug reaches the intestines, that remedy is undoubtedly the most efficient means of securing the introduction of an astringent into the small intestine.

*Sulphuric acid* is recommended by Hare in doses of 5 to 10 drops diluted with water in passive hæmorrhages. From what we know of its pathogenesis, it should prove valuable in some cases. *Turpentine* in doses of 10 drops administered in capsule or Acacia emulsion is also efficient in some cases of passive hæmorrhage.

*Chloride of Calcium* has lately come into use as a remedy for internal hæmorrhages, because of its ability to increase the coagulability of the

blood. To be effective, it must be given in relatively large doses, *i. e.*, 30 grains repeated every two hours. The main objection to its use seems to be its inability to produce its effects with sufficient promptness.

The administration of *Ergot* seems more reasonable in intestinal than other internal hæmorrhages. It will give the best results if administered hypodermically. The general trend of opinion, however, is against its efficiency.

When the hæmorrhage is from the large intestine, we may reach the bleeding point by the injection of astringent solutions by the rectum. For this purpose have been recommended, *Alum* in the proportion of 10 grains to the ounce; *Cupric sulphate*, 5 grains to the ounce; *Tannic acid*, 20 grains to the ounce of water and glycerin; *Subsulphate of iron*, 10 grains to the ounce. The enema should be administered in small quantity, four to eight ounces, so as not to excite the bowel to activity, and it should be thrown high up into the colon.

*Hydrastinine hydrochlorate* is well spoken of by several authorities, while it is condemned as useless by others. The doses recommended range from one-twelfth to one grain hypodermically. Foster, who is the advocate of the smaller dose mentioned, even declares it dangerous.

In certain intractable cases one should resort to Dawbarn's method of bleeding the patient into his veins. The method is rational, and carefully applied is harmless.

Aside from the above-described measures directed to the control of hæmorrhage *per se*, one should endeavor to make a diagnosis as to the cause of the bleeding and institute etiological treatment. Thus, hæmorrhage from the intestines may be produced by such local lesions as ulcers, catarrhal inflammation, excessive use of laxatives, tumors, embolisms and thrombosis, passive congestion from disease of the heart and lungs, portal stasis, as in cirrhosis of the liver, volvulus, intussusception, chronic constipation, vascular lesions, as varicosities and aneurisms. Among the constitutional diseases of which it may be a symptom are pulmonary tuberculosis, scurvy, pernicious anæmia, leukæmia, septicæmia, yellow fever, phosphorus poisoning, interstitial nephritis, intermittent fever, variola, typhoid fever, erysipelas, and typhus. Although in the case of hæmorrhage as a complication of most of these diseases the outlook is bad, nevertheless the internal medication and general measures suited to the case in hand, and as described in other portions of this work, should be tried.

When hæmorrhage takes place from a portion of the intestinal tract accessible to operation, the measures ordinarily successful for the control of hæmorrhage, as pressure, suture, ligation, and styptics, offer good promise of success.

The internal medication from a dynamic standpoint is useful only in those cases in which the bleeding is the result of a general condition, and

not to a local lesion. The selection of the medicine *must* be made on a symptomatic basis.

## Enteroptosis.

There are very few therapeutic problems of greater importance or requiring nicer judgment than those involved in the treatment of patients with enteroptosis. It might seem at first sight that it is the anatomical condition only with which we have to deal; but when we consider that these are ofttimes so widespread and so diverse, and that they not infrequently exist without symptoms, we at once appreciate our difficulties. In the well-marked cases, the enteroptosis is associated with gastroptosis, cardioptosis, nephroptosis, as anatomical conditions; the patient is ofttimes anæmic; usually a woman, we find displacement of the pelvic viscera, which some would claim are secondary to the displacements of the other viscera. She is highly neurotic, and complains of constant tired or prostrated feelings. Digestion is performed uncomfortably. The bowels are usually constipated. Treatment, to be efficient, must take cognizance of the visceral displacements, and at the same time attempt to alleviate the numerous associated symptoms. As many as have been the cases of splanchnoptosis that have come under my care, I must confess myself at a loss to decide as to the best course to pursue. Sometimes, in view of the futility of all efforts, I have felt inclined to agree with a recent English writer who contended that nephroptosis is after all but a sign of physical degeneration. This view finds confirmation in the investigation of the family histories of these patients, when the physician finds other members of the family, who, though not the victims of any of the varieties of splanchnoptosis, still have all the stigmata of hysteria or neurasthenia.

The rational treatment of the condition seems to be summed up in the following propositions:

1. The increase of the intra-abdominal pressure, by reason of which the prolapsed viscera are held in better position for the performance of their function.

2. Systematic rest and feeding, by means of which the patient's general health is improved, and the strength of the normal support of the prolapsed organs is increased.

3. Attention to the hysterical and neurasthenic elements in the case. This means, as a rule, the removal of the patient from the care of injudicious relatives and friends to a sanitorium or hospital.

4. Attention to the gastro-enteric functions, which includes careful selection of a diet which shall be digested with comfort, and measures securing proper functioning of the bowels.

5. General medication, which shall take cognizance of the neurasthenia and the various symptoms present. As a rule, such medication must be directed to the constitutional rather than to the local symptoms.

1. **Increase of the Intra-Abdominal Pressure.**—This is best secured by the wearing of a properly fitted abdominal binder, and the abandonment of the corset. When the enteroptosis is associated with a movable kidney, as is usually the case, a properly adjusted pad adds greatly to its efficiency. Lincoln, of New York, advises very strongly in favor of a systematic application of oxide of zinc adhesive strips about two inches wide, so arranged as to give a support to the lower abdomen, and thus elevate the prolapsed organs. Such strips undoubtedly accomplish the purpose for which they are intended, but are objectionable mainly because of the difficulty of their removal. Needless to say, they can be applied by the physician only.

The retaining apparatus should always be applied with the patient in the recumbent position with the hips well elevated.

2. **Systematic Rest and Feeding.**—In the cases in which the lesions are as yet but slight, the laying down of dietetic instructions which shall force upon the patient the taking of reasonably large quantities of easily digested fats, as butter and bacon, a well-selected mixed diet including meats and vegetables in season, and milk and eggs. In the case of patients who cannot afford to go to bed for a prolonged period, and cannot have a nurse, we must insist upon one hour's rest after each meal, and the taking of mid-meal light lunches. General and abdominal massage is necessary to take the place of exercise of which these patients are deprived.

3. **Management of the Associated Hysteria and Neurasthenia.**—This requires attention to the details to be hereafter presented when I come to speak of the treatment of neurasthenia and hysteria. As a rule, this means placing the patient in the care of a suitable nurse or attendant, the removal from family, and the seclusion in sanitorium, or mountain or seashore resort. The advantage of abundance of fresh air cannot be overestimated in the ambulant cases.

4. **Attention to the Gastro-Enteric Functions.**—The physician usually finds that these patients are underfed, that they have subjected themselves to a course of semi-starvation under the superstition that food disagrees. It is our duty then to force nutrition. It is claimed by some authorities that nothing does more good in the splanchnoptoses than the storing up of peri-visceral fat. We should then start in with easily digested foods, small in quantity and at relatively long intervals at first; as rapidly as possible we should increase the range of articles and their quantity. With these agreeing, the patient should be fed more frequently. A most important part of the dietary should be butter, of which the patient should arrange to take not less than four ounces daily.

The functions of the bowels must be watched. With the administration of such large quantities of food, a daily evacuation is necessary. For this purpose, nothing is better than the solid extract of Cascara, which

should be given in suitable doses, as recommended in the article on chronic constipation.

5. **Medicines.**—The remedies required are usually those having an action on the constitution of the patient. They include especially *Ferrum*, *Strychnia*, *Arsenic*, *Zinc*, *Zinc phosphide*, and the many anti-hysteric remedies.

In very severe cases, our only recourse is to the systematic Weir-Mitchell treatment, which I believe has in splanchnoptosis one of its bright fields of utility.

## Intestinal Neuroses.

Two of the intestinal neuroses have already been considered under other headings, namely, enteralgia and membranous colitis. The remaining diseases of this class may best be considered collectively. Before undertaking the treatment of one of these cases, there must be a positive certainty that the case is purely neurotic. Too often has it been my experience to be called in cases in which the diagnosis of intestinal neurosis has been made simply because of the scarcity of data pointing to some other and more probable complaint. Again, in the treatment of intestinal as of other neuroses, it must be borne in mind that the patient himself is the most important factor; in other words, the intestinal condition is more readily reached by attention to the patient's nervous constitution than it is by local measures directed to the intestines. True it is that local lesions of the rectum or urinary apparatus may play an important part as etiological factors, and when present, should receive our earnest consideration.

The diet in cases of intestinal neuroses should be selected for the patient in particular; to a certain extent, we may pay some attention to his complaints. It is, as a rule, useless to limit his diet list to articles that are digested with remarkable ease, etc., because the fundamental cause is in the nervous system, and it is that which needs building up. To this end, the patient must be fed according to the rules to be laid down in the section on the treatment of neurasthenia.

Hydropathy is of great value in many cases, but the hydriatric measures must be carefully differentiated. Thus, in the neuroses characterized by sensory or motor irritability, sedative applications are demanded. Of these, hot applications, as the Priessnitz bandages at night, are in order. Under no circumstances should cold enemata be advised. When the general neurasthenic condition is well manifested, we may, with advantage, advise the cold sponge bath each morning, laying particular stress upon the importance of the brisk friction following the sponging.

Massage is to be used only in those neuroses in which motor function is diminished. It is certainly contra-indicated in spastic conditions. An exception to the latter statement may be made in the employment of general massage to the exclusion of local as a means of improving the constitutional neurasthenic state.

Electricity is useful in the majority of cases, but its application must be based upon indications. In enterospasm, peristaltic unrest, and the hyperæsthesias, the galvanic current is essential. The electrodes should consist of large plates made of material that will permit them to be bent to the shape of the patient to secure evenness of application. The positive electrode should be applied to the abdomen, and the negative to the spine. The seances should be ten to fifteen minutes daily, and the strength 10 to 15 milliamperes. If such currents cause pain, their strength should be reduced. Faradism, on the other hand, is indicated in cases requiring stimulation, especially in paralysis of the bowels attending spinal cord lesions.

Very little can be said individually of the various nervous affections of the bowels, as their management is so dependent upon that of the underlying conditions.

Paralysis of the bowels is practically always a symptomatic condition. Nevertheless, something may be done by special or local measures. Electricity and massage serve to promote the local nutrition. They aid, in a limited way, the feeble motor powers already existing. Large enemata of water or oil are usually required to secure regular evacuations. Purges of all kinds are absolutely useless, if not actually harmful. It is unfortunate that this fact is not generally recognized and adopted in practice, for all of us meet with cases in which purgatives have been greatly abused and have done incalculable harm.

In paralysis of the sphincter ani, much may be done in the way of alleviating the patient's sad predicament by keeping the colon comparatively empty by large enemata administered three times daily. In suitable cases, an anal obturator or support gives the patient great satisfaction. Electricity applied to the sphincter has a limited use. I feel pessimistic as to its value, for I have never seen any results. Hemmeter praises the injection of strychnia hypodermically into the folds of the anus.

**Romberg's Neuralgia,** or Neuralgia hypogastrica, demands that a special examination be made of the rectum and the genito-urinary apparatus for local lesions, which may act reflexly. Otherwise, no special measures for its management need be mentioned.

As with most neurotic affections, properly regulated rest is the most important therapeutic remedy. It is certainly remarkable to note the improvement following upon the patient's removal from household or business cares to quiet surroundings.

Nothing can be said of medicines having a special relationship to the class of maladies under study. We are obliged to treat the case symptomatically. The remedies which will prove the most useful are those adapted to neurasthenic and hysterical states.

## Enteralgia.

On page 252 of my work on Diagnosis, I wrote : "The use of the term enteralgia as a simple nervous affection of the intestines should be condemned, for such cases are practically never observed, if we except the crises of locomotor ataxia and the neuritic affections of the abdominal walls. Truly the diagnosis of nervous pain in the abdomen covers a multitude of mistaken diagnoses." To the opinion thus expressed, I still hold. An explanation of the *raison d'etre* of the present article is evidently required.

Clinically, we meet with a class of cases in which certain causes, as improper food, indigestion, flatulence, constipation, and other local disorders, give rise to paroxysms of severe intestinal pain. It is more than probable that the local conditions do not constitute the only cause for the attacks. Were it so, such cases would be observed far more frequently than they are. It is necessary then to search for predisposing factors. A thorough examination into the history of these cases show that the patients are neurotic, gouty, hysterical, or rheumatic. Sometimes their natural neurotic habits are intensified by unusual anxiety, excessive mental labor, and violent emotions. Sometimes the attacks seem to be induced by the immediate action of these nervous agencies. Again we observe cases in which the attacks are brought on by indulgence in some particular article of diet which nearly all persons can take with impunity. The articles usually mentioned as thus liable to bring about attacks include certain shellfish, strawberries, ice-cream, ice water, and veal.

Of the pure enteralgias, the intestinal crises of locomotor ataxia afford the best example. The intestinal and gastric pains of spinal caries rarely present the paroxysmal character observed in the class of cases we are pleased to call enteralgia.

Another class of enteralgias is that observed in connection with enterospasm. Such cases often prove very puzzling in practice. According to the location of the spasm, they may be mistaken for cholelithiasis, appendicitis, and renal colic. Indeed, I have under my care at the present time, a patient who has had surgeons propose to operate him for each one of these affections.

In the treatment of enteralgia, one has a double problem before him, namely, the relief of the attacks and the prevention of recurrences. For the relief of the attacks, the indications are amelioration of pain and the emptying of the intestines of their abnormal contents. For the pain itself, there is nothing that will take the place of opiates, especially Morphia and Codeia. I have always used Morphia, though there are some who prefer Codeia because it interferes less with the intestinal peristalsis. The Morphia should be given hypodermically. The dose required is usually one-quarter of a grain. It is seldom that one-eighth of a grain will suffice. Codeia

phosphate should be given in larger doses, namely, one-half grain. It is claimed that it has a stronger influence in relieving abdominal pain than any other drug; but this is mere conjecture and remains to be proven.

The emptying of the bowels is rarely efficient, even though possible, until the Morphia has been administered. One of my patients is a remarkable example in this respect. For a number of years he was subject to paroxysms which gave such good clinical pictures of intestinal obstruction that twice he was prepared for operation. Enemata of all kinds and purgatives were powerless to produce a bowel movement. As soon, however, as the intestinal spasm was relieved by a hypodermic injection of Morphia, and an enema administered, a free movement took place, and the paroxysm was over. This case is an exaggerated example of many others, and teaches us the value of prescribing the sedative or antispasmodic before the evacuation of the bowels is attempted.

As additional means of relieving pains, we have hot bottles, poultices, compresses, etc.

The diet during the attacks should be very sparing. Usually there is no difficulty encountered in this direction, for the patient cares for but little food, and is very willing to subsist on a sparing liquid diet.

Under the measures above indicated, attacks soon subside, and the patient returns promptly to full health. When, as sometimes happens, the convalescent period is protracted, it must be managed on general principles.

Between paroxysms, the patient with enteralgia should be treated strictly according to the totality of his case. Underlying neurotic, gouty, and rheumatic constitutions should be systematically treated according to principles laid down in the articles dealing with these ailments. Incorrect eating habits must be corrected. Especially should the bowels be encouraged to regular action, according to instructions laid down in the article on "Constipation."

In those cases in which the trouble is evidently dependent upon enterospasm, there is no more efficient remedy than *Atropia*, but it must be given in small or moderate doses. In most cases, $\frac{1}{200}$ of a grain three times daily is tolerated very well for a couple of days. After that time, the physiological effects of the drug, viz., dryness of the mouth and dilatation of the pupils appear, when the dose should be reduced to $\frac{1}{400}$ of a grain from two to four times daily. If used during the paroxysms, Atropia may be given alone or in conjunction with Morphia. The dose should then be larger than above indicated, *i. e.*, from $\frac{1}{60}$ to $\frac{1}{120}$ of a grain, but not repeated.

In the majority of cases of enteralgia, one of two remedies will be found indicated. They are Colocynth and Belladonna. *Colocynth* represents the nervous type of the disease. The pains are of a griping character, and are relieved by pressure or by "bending double," and by passage of stool

and escape of flatus. Colocynth may be indicated also in the gouty and rheumatic cases.

*Belladonna* is useful in the pure neuralgic and flatulent forms. It is the principal remedy in the gastric and intestinal crises of locomotor ataxia, and is frequently useful in the lead colic. The pains are characterized by their sudden onset, and equally rapid disappearance. Flatulence is usually present, and is evidenced by distention of the transverse colon. The pains are aggravated by light pressure, but relieved by hard pressure over the abdomen.

*Nux vomica* is the remedy in those colics which occur in persons the subjects of gastric disorder, of constipated habit, and who have long been addicted to the abuse of laxative medication. The paroxysms are attended by considerable flatulence, which interferes with the respiration. Quite commonly these patients suffer from hæmorrhoids.

When the patient is highly neurotic and in a condition of lowered nutrition, *Strychnia* in doses of $\frac{1}{200}$ of a grain may be given every three to four hours, as more efficient than Nux vomica.

*Dulcamara* is indicated in cases characterized by return of the paroxysms during cold weather, or when exposure is the principal cause of the illness.

*Plumbum* is the remedy in cases of enteralgia associated with interstitial nephritis. The abdominal walls are retracted. The pain is excruciating, and may even be associated with delirium. It radiates in various directions, attendant symptoms appearing in accordance with the part to which the pain spreads. Thus, with the chest involved, there is dyspnœa; retraction of the testicles and cramps of the legs, when it extends downwards. The bowels are obstinately constipated.

*Dioscorea* is adapted to cases of enteralgia occurring in persons of reputed feeble digestive powers. There is considerable flatulence, but its expulsion brings no relief to the pain. The characteristic pain centre under Dioscorea is about the sigmoid flexure. The pains are aggravated by "bending double" and by rest. The patient is obliged to keep himself moving.

*Chamomilla* is the remedy for cases associated with great flatulent distention of the abdomen. The pains are of a griping, tearing character and centre about the umbilicus. The characteristic Chamomilla patient presents a high degree of mental irritability.

*Rhus tox.* is indicated in rheumatic cases. The pains are relieved by bending double, and walking about, or by lying on the abdomen.

For the relief of the pains of locomotor ataxia, the most efficient palliative is *Antipyrin* or *Acetanilid*, administered in the manner to be recommended hereafter when dealing with the treatment of locomotor ataxia.

Many of the neurotic cases are amenable to galvanic treatment. The

rectum should be filled with water, and the positive pole inserted. The abdominal electrode—the negative—should be made to cover as much of the abdomen as possible. The current should be strong enough to give the patient a decided sensation of its presence without producing actual discomfort. Usually this means about 10 milliamperes. The sittings should be of about five minutes duration, and be repeated daily.

### Intestinal Tumors.

The treatment of intestinal tumors involves two problems, assuming, of course, that the diagnosis made is beyond reasonable doubt. The first problem is that which relates to the extirpation of the growth by the surgeon. The second problem arises when the case is not amenable to surgery, under which circumstances all we can do is to maintain the patient's strength, prescribe such a diet as will lessen the evil effects of the diminished intestinal calibre, relieve pain, and give symptomatic treatment for any other condition which may exist.

Inasmuch as the extirpation of the growth is the only line of treatment which promises to prolong the patient's life for more than a few months, it is the one which demands our most serious consideration. To secure success, early operation is necessary. A very good rule for guidance is to perform an exploratory laparotomy when there are undeniable symptoms of stenosis gradually increasing in severity. It must, of course, be positively determined that the seat of obstruction is not in the rectum or lower colon. To eliminate this factor, the patient should be anæsthetized, and the lower bowel examined as high as possible by Simon's method. If a case of stenosis is permitted to progress until complete obstruction exists, we cannot hope for success from surgical intervention. This is shown by Schede's experience, he having operated on six such cases, all of whom died. In twelve cases in which the obstruction was partial, all but three recovered.

Operations for the removal of intestinal growths should not be undertaken lightly. The average mortality is now believed to be somewhat over 30 per cent. Weir's statistics, which are not recent, gives a mortality of 51.5 per cent. in 33 cases; Franks, 40.8 per cent. in 51 cases. We have good reason for believing that the results should be much superior to similar operations on the stomach, and that the period of freedom from return of the growth should be longer. There is every reason then why extirpation of intestinal growths should be encouraged, unsatisfactory though the results be at the present time. They are certainly no worse than was the ovariotomy of the days of McDowell and Atlee. To a certain extent, this comparison is hardly fair, because the differences in surgical measures between now and then are so great. But *experentia docet*, and there is no reason why, with increased experience, results will be incomparably superior to those at present attainable.

Much of the mortality from operation is dependent upon the nature of the lesion itself, and not to the traumatism. If the patient recovers from it, his chances of a permanent cure are better than in cases of gastric carcinoma, because intestinal cancer has a much less tendency to metastasis. Rupp and Korte have reported cases still living nine years after extirpation of the growths.

When the case has progressed to a stage at which extirpation is not permissible, because of the hopelessness of the result, we may still expect something from palliative operations. These include the establishing of an artificial anus above the seat of obstruction and the performance of an intestinal anastomosis around the tumor. Such operations give better immediate prognoses than does excision. The duration of life is variable. As a rule, it is limited. Cases have been reported in which life has been prolonged three and a half years.

In the case of carcinoma of the rectum, the results have been much better than in malignant disease of any other portion of the alimentary tract. The mortality following operation in recent cases is low, and in a very large proportion there is no recurrence. Kraske makes the percentage of recurrence as low as 41.6 per cent. and Levinsohn 73.3 per cent. The victims of the illness will take into serious consideration the functional condition following the operation. Their inquiries can be answered quite readily. If the sphincter ani can be saved, the result as to function will be good; if, on the other hand, it has to be sacrificed, there must ensue an incontinence of fæces.

As to the selection of cases of rectal cancer for radical operation, the important indication is not the size of the tumor, but its mobility. In doubtful cases, it is a wise plan to reserve a decision until an examination can be made under complete anæsthesia.

So-called conservative operations on rectal cancer, as curettement and electrolysis, are condemned by those who have had the most experience with the disease.

The making of an artificial anus as a palliative procedure should be recommended in all cases not amenable to extirpation. This operation is capable of prolonging life many months, if not years, because the structures surrounding the rectum are unimportant from a functional standpoint; so the cancer can grow for a time at least without doing very much damage. The only objection that can be offered to it, is the unpleasant plight it leaves the patient with an artificial anus in the groin. Still, the majority of patients learn to adapt themselves to the new condition, and feel satisfied with the result.

If operation is refused or is not possible, cases of intestinal tumor can be treated palliatively only. Pain is to be relieved by analgesics, especially Morphia. The diet should be such as to leave but little residue.

Salads, heavy vegetables and fruits are to be avoided. The food administered should be selected from the following list: Milk, broths, eggs, broiled meats, toast, crackers and butter. There is, in all cases, a stage in which, when reached, the stenosis is nearly complete, and nourishment must be by the rectum entirely.

### Intestinal Ulcers.

**Ulcers of the duodenum** should be treated systematically, according to the methods already outlined for the cure of gastric ulcer. The medical attendant must remember, however, that his chances of succeeding with purely medical treatment are comparatively poor. The chances of perforation are greater than in gastric ulcer; and even though he succeed in bringing about healing, the resulting cicatrix is usually not of the smooth variety, and tends to contract and produce subsequent stenoses.

As soon as the practitioner makes a diagnosis of duodenal ulcer, it is just as surely his duty to associate with him a surgeon, as it is in cases of appendicitis. The symptoms which justify this course are persistent and severe pain and tenderness in the right hypochondrium, epigastrium or umbilicus, in association with intestinal hæmorrhage. If symptoms are not urgent, he should place the patient at absolute rest in bed, feed him by the rectum exclusively, and apply hot poultices to the painful area. This treatment should bring very prompt relief. It has been stated that if there is not evidence of a complete cure in the course of two weeks, the case should be operated without further delay. I would limit the period of medical treatment still further, and make it but one week, for if cure is to take place, the patient should be absolutely comfortable by this time.

If he is sufficiently fortunate to bring about the best possible result, the period of rectal alimentation should be continued to the patient's limit of tolerance as to time. With the beginning of gastric feeding, the articles permitted should be such as will certainly pass through the duodenum in a liquid condition, as broth, milk, and barley water, etc. Even then, with what we are pleased to call a complete cure resulting, the patient must be watched carefully for a number of years, not only for symptoms suggestive of the return of the ulcer, but also for symptoms of intestinal stenosis as showing the formation of a contracting cicatrix.

Ulcers involving portions of the intestinal tract other than the duodenum demand plans of treatment varying according to the hypothetical situation and character of the lesion. **Ulcers of the large intestine,** for example, are best treated by local measures. Ulcers involving the small intestine can be reached only by general hygienic measures, which are almost always uncertain as to their result. Certain ulcerations require constitutional measures. Whatever plan of treatment is selected, the first point that the physician shall decide concerning it is that it shall do no harm.

The diet is of the greatest importance. It must be non-irritating both chemically and mechanically, and as highly nourishing as possible. Hemmeter * has proposed the following schedule:

8 A.M.—1 cup of chocolate—preferably acorn chocolate—boiled with very thin milk or water; 1 zwiebach or toast and butter.

10 A.M.—1 cup of strained oatmeal gruel or beef bouillon or chicken broth with rice.

1 P.M.—Soup made of peas or beans with bouillon and egg added; eucasin, tropon, or nutrose may be added to heighten the nutritive value of the soup; of vegetables, only potato in puree form; of meats, only calves' brains, sweetbreads, and tender fish, without many bones, permitted. All fruits are forbidden, with the exception of strained huckleberries, which can be added to gelatin. For dessert, egg-custard, gelatin flavored with claret, and a minimum amount of lemon juice. Beverages, old Burgundy and claret, and Rockbridge alum water—not over six ounces at a time of the latter.

4 P.M.—1 cup of tea, sweetened with saccharin, cakes, toast, or zwiebach, with butter.

7 P.M.—Meat pulp, very finely scraped in the kitchen at home (never to be bought already ground or chopped up by the butcher), seasoned with salt and rapidly broiled in butter; 1 glass of huckleberry wine, strained or good claret. Stale wheat bread or toast with butter.

If milk is well borne, it may be permitted, but must be forbidden when it causes diarrhœa.

*When a constitutional disorder is apparently the cause of the ulceration*, as tuberculosis, syphilis, scurvy, variola, etc., the treatment must be directed mainly towards it. Syphilitic ulcers nearly always make good recoveries under antisyphilitic medication assisted by the proper hygienic measures. Tubercular ulcers sometimes heal under the open-air treatment combined with absolute rest in bed and proper diet.

In many cases we must rest satisfied with treating symptoms only. Those which engage our attention mainly are pain, hæmorrhage and diarrhœa. The pain usually disappears by irrigations when the lesion is in the large intestine. Hæmorrhage requires the line of treatment laid down in the section on enterorrhagia.

When the indications favor a diagnosis of ulceration of the large intestines, irrigations of Thymol, 1 : 2,000; Salicylic acid, 1 : 300; Boric acid, 1 : 500; or Silver nitrate, 1 : 500, are indicated.

Internally, our resources are very limited. Boas, Hemmeter and others favor the administration of Bismuth in large doses, trusting that some of the powder will act as a surgical dressing to the ulcers. How

* *Diseases of the Intestines*, vol. i, p. 663.

slim are the chances of this much desired result my readers may well surmise. Of other remedies, the best that we can offer are *Argentum nitricum*, *Kali bichromicum*, and *Mercurius corrosivus*.

Intestinal surgery is too youthful an art to enable us to say just what it can do in ulcerations of other portions of the intestines than the duodenum and rectum. In both of these localities it is capable of working marvels. Ileo-cæcal tuberculosis is certainly within its scope. When it is known that we are dealing with a limited ulceration of the small intestines, entero-anastomosis offers considerable. In obstinate ulceration of the large intestine, it is possible that by making an artificial anus in the right iliac region, thus throwing the colon out of service for a time, and affording us the opportunity of giving it repeated irrigations, we may effect a radical cure.

## Appendicitis.

Increasing experience in the observation and treatment of appendicitis has led to less divergence of views between physicians and surgeons. With very few exceptions, authorities unhesitatingly admit that the greater preponderance of cases demanding operation should lead us to place appendicitis on the list of surgical disorders. On the other hand, nearly all cases are first seen by medical men. Hence, be the final result what it may, the decision as to the plan of treatment to be adopted rests with the latter. It is necessary then that the general practitioner should entertain clearly-defined ideas as to the character of cases which should be operated, and the time at which surgical interference is likely to give the best possible results. Unfortunately, his limited experience is such that his judgment is not always of the best. The medical man, even of large general experience, sees but three or four cases of appendicitis annually, while there are surgeons who operate that many hundred annually. If all cases demanded operation, the question would be an easy one to decide, for there could be but one answer. Again, if the medical man would but view the subject from outside his limited sphere of observation, many cases which are brought to the surgeon too late would be saved. As soon as a medical practitioner has diagnosed a case of appendicitis, he should associate with himself, in its management, a surgeon in whom he has confidence, and upon whom he should depend for advice as to the proper time for operation.

It is universally admitted, even by the most enthusiastic adherents of surgical intervention, that from 80 per cent. to 85 per cent. of attacks of appendicitis recover without operation. It is also admitted by medical men that many of these subsequently suffer from relapses or recurrences. The frequency of such recurrences has been variously placed at from 25 per cent. to 95 per cent. It will thus be seen that the majority of cases of appendicitis must ultimately come under the surgeon's knife. Osler,*

* *Practice of Medicine* 6th edition, p. 518.

speaking on the above subject, says : "So impressed am I by the fact that we physicians lose lives by temporizing with certain cases of appendicitis, that I prefer, in hospital work, to have the suspected cases admitted to the surgical side. The general practitioner does well to remember—whether his leanings be toward the conservative or the radical methods of treatment —that the surgeon is often called too late, never too early." Later in the same article he says : "Operation is indicated in all cases of acute inflammatory trouble in the cæcal region, whether tumor is present or not, when the general symptoms are severe, and when at the end of forty-eight hours, the features of the case point to a progressive lesion. The mortality from early operation under these circumstances is very slight."

German medical men, on the other hand, are less progressive than are we in America, in that they hold very conservative views respecting the propriety of operation in appendicitis. Ewald,* for example, limits the indications for operation to the following cases : 1. As soon as a perforation has occurred, followed by a general peritonitis. 2. When in the course of the disease, with acute symptoms of advancing inflammation, there is formed a purulent collection in such a location that the operation would amount to nothing more than the opening of an abscess. 3. Another indication for operative interference is furnished by those cases of recurrent perityphilitis, in which the frequency and increasing severity of the attacks not only offer a continual menace to the patient, but also interfere with the earning of his living. 4. Finally, an operation is also indicated in those cases of chronic appendicular colic, which do not present the classical symptoms of perityphilitis, but run their course with indefinite and obscure symptoms, and can be properly diagnosed only when the swollen appendix is appreciable by palpation. All of us must agree with Ewald that the different classes of cases mentioned by him should be operated ; but we are still willing to take a still more advanced position, and say that all cases, the last one excepted, should be operated long before the pathological changes have progressed to the stages he describes. No appendicitis should be permitted to go on to perforation or suppuration. If such unfortunate accidents do happen, the physician or the patient has been dilatory.

The victims of appendicitis come under the physician's care either during an attack or during the period generally known as "between the attacks." How shall he decide as to the proper course to pursue or advise ?

1. **During the Attacks.**—Given a case seen early and an operator of experience, there can be no question as to the advisability of operating at once, for the mortality under such circumstances will be practically *nil.* But we do not always have any assurance that the case has been seen as

* *Twentieth Century Practice of Medicine*, vol. ix.

early as the history suggests, for it not infrequently happens that the pathological process goes on for several days before it produces symptoms sufficiently obtrusive to force the patient to the belief that he is ill. It has, therefore, happened many times that surgeons have opened the belly to find not a simple appendicitis, but gangrene and other far advanced changes. Such a possibility instead of deterring us from advising operation, should be an argument in favor of surgical interference. These latent cases are always serious, and nothing is to be gained by waiting. The factors in favor of early operation are the safety of the patient, the ease of operation, the short convalescence, the prevention of recurrence, and the lessened risk of hernia at the operation wound.

It is quite natural that physicians should be slow in advising a capital operation on a patient whose illness has not as yet exhibited any serious features. We cannot, therefore, expect them to accept the positive views I have just expressed. They will insist upon waiting for a sign or signs. Of these, there are plenty, but the most important will be found by a study of the tenderness, rigidity of the muscles over the painful area, and the state of the pulse.

*The Pain and Tenderness.*—The pain is not always manifested in the right iliac fossa in the commencement of the attack, for it may be about the umbilicus. Eventually, however, it localizes itself in the former place. With such pain increasing in severity and area, we have an indication for operation. Let me say right here that in the clinical study of cases, the general trend of the illness under well-directed treatment forms a very important guide as to diagnosis, prognosis, and additional treatment. Given, therefore, a case of appendicitis under well-devised medical treatment, the symptoms should recede promptly if operation is to be avoided. If, on the contrary, the symptoms one or all become intensified, time should not be lost in trying other medical devices; the case should go to the surgeon at once. Forty-eight hours is the outside limit that the medical man should wait for his results; and in many instances, even this is too long.

The presence of right iliac tenderness is even more valuable than the pain. The error liable to arise in the study of this symptom is the mistaking of appendical hysteria for appendicitis. To mention the possibility of such a mistake is to guard against its occurrence. When the tenderness is associated with rigidity and fever, and there is a rising leucocytosis, the diagnosis is conclusive, and the propriety of operation evident.

*The Fever* is too variable a quantity in appendicitis to be of much value either in diagnosis or in deciding as to treatment. Severe or dangerous cases may be unattended by rise of temperature; while moderate fever not infrequently attends cases which may, as shown by the other signs, have the operation deferred to a more propitious time. When, however, we have before us a case presenting a temperature ranging about

103° F. or higher, and after 48 hours there is no sign of defervescence, the propriety of operation is not to be questioned. Again, when the fever is high in the beginning, it is a good plan not to wait, but to operate at once.

*The Pulse* is unquestionably one of our most valuable guides. Given a pulse-rate disproportionately rapid to the degree of fever, and one has good reason to conclude that there are "breakers ahead." No arbitrary rating of the pulse frequency should serve as a guide to operation. The fever and pain should be considered with reference to the frequency and quality of the pulse. Any failure of the latter to come up to standard, should decide for immediate operation.

*Vomiting* is too frequent a phenomenon of appendicitis to be of much clinical value. When persistent, however, and especially if it is associated with constipation, abdominal distention and other signs of peritonitis, an operation must be regarded as urgent. Ordinarily, we can rely upon other symptoms than vomiting in guiding us to a decision.

*A Rising Leucocytosis* in the early stages of appendicitis is an indication for operation, as it is a sure indication of the progress of the inflammation. In certain adynamic cases in which the patient's resisting powers are feeble, this sign must necessarily fail. Late in the course of the attack when pus has formed, a leucocytosis has no value other than being an indication of the possible presence of pus.

An operation having been decided upon, it should be performed at once. Patients may beg from sentimental and other considerations for delay until the morrow; such delays should never be granted excepting under protest. In the appendicitis sick-room, procrastination is not only the thief of time, but it is a destroyer of life.

If an operation is not performed early in the course of the illness, *i. e.*, within the first 48 hours, the propriety of surgical interference may well be brought up later. If the case continues to grow worse, no one will protest against operation. If the case is *undoubtedly* improving, the decision must be against operation. But the physician must remember that the improvement may be illusory. One or two symptoms may be relieved, but the general tendency of the case in some one important particular is downward. Our guides should be the pulse, the tenderness and the rigidity, but especially the pulse. The decision must be determined in part by the fitness of the patient for operation, *i. e.*, his habits as to alcohol, and the presence or absence of serious chronic disease, as nephritis, diabetes, myocardial degeneration, and arterio-sclerosis.

Later operations, *i. e.*, those performed when the case is evidently hopeless as regards medical treatment, and almost certainly so as to surgery, must be performed from humane motives. Most of the cases die; occasionally one is saved. Each case may turn out to be one of the few

who recover. Physicians should never permit themselves to be placed in the position of letting a case go to this stage. To their credit, it may be said that nearly all such cases are examples of the reluctance of patient or family to submit to operation.

Many of the cases of the medical recoveries, the majority indeed, are apparent rather than real. The active inflammation has subsided, but there remains a subacute or chronic inflammatory process, which with added weeks or months, brings about an increase of the local lesions. Such cases are ready in response to an exciting cause, ofttimes without any cause whatever, to awaken into renewed activity, and become acutely dangerous. On the other hand, there is a certain proportion of cases which end with the one acute attack. It is impossible to say *a priori* just which these fortunate cases will prove to be, just as it is impossible to determine which ones will recover from acute attacks under purely medical management. All patients who have had appendicitis should be carefully watched, and instructed as to a proper mode of life to avoid a recurrence. With the slightest semblance of a renewal of the disease, they must be subjected to operation. Patients who have had two or more attacks must be regarded as individuals who carry within themselves a charge of dynamite ready to explode at any moment. Such patients should be operated, and moreover, should feel grateful that they have such a ready means of cure at their disposal. The operation itself in the hands of an experienced surgeon involves but little danger. Sir Frederick Treves has performed over 2,000 interval operations with but two deaths. They are afforded the opportunity of making a careful selection of a skilled surgeon, and placing themselves in a good hospital, where may be had all the organizations and necessities for a successful result.

Operation having been refused or deemed inadvisable, a consideration of the medical management of acute appendicitis is now in order. The patient should be put to bed, and kept at absolute rest. He should be obliged to use the bed-pan and urinal for the calls of nature. He must be kept quiet and as free from restless tossing about the bed as he possibly can.

In the beginning, his bowels must be thoroughly evacuated. If there is evidence that the attack has been provoked by injudicious food, a purge of Castor oil or Calomel may be administered. Otherwise, the bowels should be excited to action by an enema, preferably of half an ounce of turpentine with a pint of water, or eight ounces of glycerin in a quart of water.

His diet must be sparing. That which is administered should be liquid, preferably light broths. If milk is administered, it should be peptonized or given in combination with lime water. It is best to give the nourishment in small quantities and at short intervals. Nutrient enemata are advocated by many surgeons. As a rule, in acute appendicitis, the patient is well able to withstand a period of three or four days starvation. The weak-

ness which this adds to the case is not an important item in endangering the patient's chances, should an operation be subsequently decided upon. Hence, nutrient enemata are not indicated early in the treatment. The continued purgation advised by some authorities is to be condemned, for it produces an excessive peristalsis and tends to cause a spread of the infection.

The application of extreme cold to the right iliac region in the form of ice-bags or Leiter's coil is beneficial. The principal objection to their use is that they may lessen the pain to such a degree as to lull the physician and family into a sense of false security. Still there need be no danger of this if careful attention be directed to the condition of the pulse, and the tenderness and rigidity.

Under no circumstances should blisters or leeches be applied to the painful area. In the first place, they are useless, and, in the second, they cause wounds which increase the chances of infection should an operation be decided upon subsequently.

To use or not to use opiates for the relief of pain is one of the moot questions concerning the treatment of attacks. A very large proportion of medical men endorse the practice. In their favor it is stated that they give the inflamed parts rest by staying peristalsis, and they decrease suffering. To these claims, we may answer by stating that opium does not lessen the infection, though we must admit that the "splinting" of the intestines should exert a favorable influence on the inflammation. The added objection that its use favors paralysis of the bowels should operation be performed is debatable. As to the second objection to opiates, that they conceal symptoms and prevent proper observations as to the progress of the case, I believe this to be true in part only. To a skilled observer the analgesia produced by Opium should not prove deceptive, especially as he still has the pulse, tenderness and rigidity as invaluable guides, to say nothing of the general appearance of the patient.

The remedies suited to cases of appendicitis are but few in number. *Belladonna* is unquestionably the most frequently indicated. It is well adapted by its symptomatology to the tenderness, pain, rigidity of abdominal muscles, and the fever. It is probably indicated in 90 per cent. of the cases in their early stage. Should the case make good progress, it should be continued until convalescence is assured. It may happen that the character of the fever may lead to the administration of *Aconite* before the symptoms indicative of appendicitis are manifested. But Aconite cannot be the remedy after evidences of a well-defined local inflammation have appeared.

With the appearance of symptoms indicative of peritonitis, toxæmia, pus formation, etc., we have suggested remedies which may be studied in the various sections devoted to the treatment of these conditions. It is sufficient to mention *Rhus, Bryonia, Hepar, Hyoscyamus, Mercurius,* and *Arsenicum.*

As to the necessity of Morphia or Opium to relieve the pain it may be said that a case requiring their use for this purpose for longer than the initial few hours, is one that should be submitted to operation.*

When vomiting is persistent, the most satisfactory remedy will be thorough lavage. It may be objected to this procedure that it disturbs the patient's rest; but it can hardly do so to the extent that intractable vomiting occurring at short intervals will.

### Intestinal Obstruction.

Given a positive diagnosis of intestinal obstruction, there can be no treatment but the surgical, which should be instituted without the slightest delay. Unfortunately, however, the clearly-defined diagnostic data as laid down in text-books sometimes fail us in practice, and as 25 per cent. of the cases diagnosed as intestinal obstruction make excellent recoveries, one is obliged, in many instances, to resort to medical treatment before the operation is proposed or demanded. Unfortunately for the surgical side of the treatment, the results are not all we would wish, for but 75 per cent. of cases recover after operation. This, of course, is three-fold better than the results shown by the physician. In defense of surgery we may add that the fatal result is due not to the operation itself, but to the intestinal or intra-abdominal condition existing when the abdomen is opened. When intestinal occlusion has been diagnosed, the physician should acquaint the family with the nature of the case, and the probable necessity for operation. If circumstances permit, he should associate with himself a surgeon to advise with him and share the responsibility. With this done, and the operation proving to be imperative, no time will be lost in obtaining the consent of the family, when such is sought. In presenting the claims for operation to the family and patient, special stress must be laid upon the comparatively good results obtained by prompt and early action. While showing that the case may be of a most serious character, it is equally the duty of the physician to point out that the case in hand may be one of those fortunate ones in which the procedures, after opening the abdomen, are of the simplest possible character. Twice have I seen at autopsy lesions that could have been removed with the greatest ease had consent to operation been given. Looking backwards, I feel assured that two lives were lost absolutely.

One is justified in resorting to medicinal or non-operative treatment in a certain percentage of cases. When he is assured that the case is one of volvulus, acute kinking, or internal strangulation, no time should be

* If during the course of an acute attack, an operation be decided upon, it is a wise plan whenever possible to remove the patient to a hospital, where he may have every advantage. There need be no fear of hazarding the patient's chances by this procedure, because with present-day facilities very sick people may be carried long distances with remarkable safety.

wasted in turning the case over to the surgeon, because cases having these lesions practically never recover excepting after operation. On the other hand, one has a fighting chance in cases of intussusception or obstruction by gall-stones or other foreign bodies. When he is positive only that the case is one of intestinal obstruction, but cannot determine the cause, he may temporize *for from twenty-four to thirty-six hours, from the appearance of the initial symptoms, but never longer.* In the meantime he should resort to certain measures having a definite idea in view. Under no circumstances should he take blind chances with irrational methods, administering one after the other without rhyme or reason. There are certain procedures which experience has taught us have a limited sphere of utility, and upon these we should depend, instituting one after the other quickly and in a rational manner. Humane feelings should not permit us to wait too long for results. The lesion in intestinal obstruction is one which should yield promptly to treatment or not at all. Thirty-six hours is then a liberal maximum period during which we are justified in following a so-called conservative course. If we cannot do anything in that time, we will almost surely fail altogether.

When starting in with the medical management of the case, we should take note of the patient's general condition, especially as regards his heart. We are justified in proceeding only when the action of this organ is normal or nearly so. Still, the surgeon may say, and with justice, that the case should be passed over to him while this desirable condition still obtains.

The lines along which the medical treatment should be conducted include the following : Diet, rest, Opium, Atropia, lavage, enemata, massage and electricity, and puncture of the distended intestinal coils. **Purgatives should never be given. They do positive damage**, which may make all the difference between recovery and death. The only possible exception to this positive dictum is in cases in which the diagnosis of obstruction by fæcal impaction is certain. The damage in other cases is the result of the increased peristalsis, which the most careful investigations have failed to show is ever capable of reducing the obstruction. On the contrary, actual experience has taught that purgatives make the lesion more complicated, and intensify the vomiting. It is true that cases in which resolution has followed brisk purgation have been reported, but they are so few in number as to be useless in establishing a precedent for practice ; certainly so in the face of the accumulated evidence which demonstrates that purgatives are murderous in the face of intestinal obstruction. Some have attempted to show that they may prove of value in obstruction due to gall-stone or other foreign bodies. Experience and reason are against them, for if the foreign body cannot travel onward with normal peristalsis, it is not likely to be any more unfortunate when peristalsis is pathologically active. The suggestion that purgation should be adopted

in the slender hope that the case may after all be one of fæcal impaction, has been made. Under no circumstances should we countenance it, as the hope of recovery is much greater under other and more rational measures.

**Diet.**—All authorities are now in accord in declaring that the patient suffering from intestinal obstruction should take no food by the mouth. The reasons prompting this course are plain. In the first place, the state of affairs is such that any food, however light and digestible and nourishing, is incapable of absorption, and, in the second place, vomiting is, as a rule, so persistent that nourishment is rarely if ever retained. Food then is useless; more than that, it is capable of doing harm. It certainly does increase the frequency and severity of the vomiting, or if retained, adds to the quantity of material filling the gastro-intestinal tract above the obstruction, increasing the intra-abdominal pressure, and lessening the chances for reducing the obstruction spontaneously. All feeding by the mouth should be discontinued. Thirst may be assuaged by the administration of small pieces of ice. In some cases this may be supplemented by hypodermoclysis of normal saline solution or by intra-rectal administration of water. The enforced abstinence of food for a maximum period of thirty-six hours does not hazard the patient's chances from operation. If one is obliged to treat the case for a longer period, he should resort to nutrient enemata that the patient's strength may be maintained.

**Opium.**—In the administration of this remedy we have a question that is one of dispute. The surgeons as a class are opposed to it because of the danger of masking symptoms. Even though the intelligent physician is able to gauge the patient's progress despite the relief afforded by Opium, the family will permit themselves to be deceived by the apparent improvement, and will, thereby, be led to oppose operative interference, however urgent it may be. Medical men find much to praise in its use. Between such diametrically opposed views there must be a happy medium. In the initial stage of intestinal occlusion, there can be no questioning the fact that a hypodermic injection of one-quarter of a grain of Morphia will relieve pain, restore a collapsic temperature to the normal, and improve the heart's action and the quality of the pulse. It is also undeniable that it may improve the local condition by removing excessive peristalsis. It must be positively understood that its real utility is limited to the first thirty-six hours of the attack. If there is a fair certainty that the case is one of internal strangulation or volvulus, it should not be given at all, and the patient should be urged to submit to an immediate operation.

**Atropia.**—Atropia secured quite a reputation several years ago in the treatment of intestinal obstruction by reason of a series of cases reported in the *Münchener med. Wochenshrift.* Of these it can be said that certain cases which presented a strong clinical resemblance to intestinal obstruction made remarkable recoveries following the administration of Atropia in

doses ranging from $\frac{1}{60}$ to $\frac{1}{20}$ of a grain. These large doses were administered hypodermatically and not repeated. The beneficial action of the drug was attributed to its influence over unstriped muscular fibres. A single dose of Atropia sufficient to exert its physiological action can do no harm, and should be tried.

**Gastric Lavage.**—A number of years ago, Kussmaul first advocated washing out of the stomach as an invaluable means of treating patients with intestinal obstruction. The lavage removed enormous quantities of gastric contents, sometimes as much as five liters. It was furthermore observed that repetition of the lavage at two hourly intervals resulted in the removal of additional intestinal contents. It is evident that lavage by reducing the intragastric pressure favors the regurgitation of the retained intestinal contents into the stomach. The repeated removal of this not only does good by lessening the pressure above the obtruction. The removal of the retained materials must also lessen such symptoms as arise from the intoxication induced by them. Lavage, to be efficient, must be performed early and repeatedly. The physician should not wait for stercoraceous vomiting. That symptom appearing, the case is urgent for surgical intervention.

**Rectal Enemata.**—Rectal enemata must be used judiciously in intestinal obstruction. The majority of surgeons are opposed to their use, as they increase the intra-abdominal pressure, and interfere with spontaneous reduction of the lesion. They certainly can be beneficial only when the obstruction is in the large intestine. Even then they are uncertain in their results. They should never be used with force. In patients who are weak and exhausted, they are capable of producing collapse. Experience as opposed to theory shows that they are invaluable in obstruction due to fæcal impaction and in cases of chronic intestinal stenosis by liquefying the intestinal contents. The temperature of the water may be anywhere from lukewarm to ice cold. The latter exerts a more stimulating effect on the intestinal peristalsis, which is lost as the water becomes warmed. Any influence exerted thereafter is by reason of their bulk. Care should be observed not to inject too large quantities—one to two liters should be sufficient—as the distention thus occasioned destroys peristalsis.

**Inflation of the intestines with gas** has about the same advantages and disadvantages as enemata. The gas used is generally Carbonic acid gas.

**Massage,** though long employed as a remedy in intestinal obstruction, is one of doubtful value. It certainly should not be prescribed in cases of internal strangulation, axial rotation, and kinking, for it can be of no benefit. When there is the slightest evidence of peritonitis, or the case has advanced to the stage at which gangrene may have supervened, it is positively dangerous. The recommendation that the massage may be performed under

an anæsthetic should not be taken seriously. About all that can be expected from it is in cases of fæcal impaction, and in some few instances of gall-stones, where the impaction may be manipulated onwards. Such procedures must be regarded as "blind shots" should they be fortunate enough to result favorably.

**Electrical treatment** is about as useless as massage, though decidedly less dangerous when misapplied.

**Puncture of the intestines** to relieve the distention by permitting escape of gas above the obstruction is recommended by Ogle in a limited number of cases, It relieves the patient's subjective symptoms, and reduces the intra-abdominal pressure. In some cases it is alleged to have brought about a complete cure. Others, among them Van Lennep, regard the operation as malpractice.

This plan of treatment is open to the objection of producing a peritonitis, although in many cases it may prove harmless. It should never be undertaken when there is a possibility of paralysis or gangrene of the bowels.

To summarize, the problems involved in the correct treatment of intestinal obstruction are all surgical. In view of the fact that some few cases recover under medical supervision, it is often a good plan to temporize for a period not greater than twenty-four hours from the time of the onset of the first symptoms. The measures employed in the interim should be such as are incapable of doing harm even though they do no good. Those which are to be recommended without qualification are abstinence from all food, lavage of the stomach, and early administration of Opium, Morphia, or Atropia. As to enemata, they may be used in selected cases as above mentioned. Purgatives should be let severely alone. Improvement should not be regarded as of any account unless it is decided, and ample evidence of a restoration of the lumen of the bowels is given by the natural escape of stool and gas. If a decided result is not obtained in thirty-six hours the patient should be turned over to the surgeon for operation.

# CHAPTER X.

## DISEASES OF THE RECTUM.

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### Rectal Abscess.

Abscesses in the ano-rectal region may be superficial or deep. When pus has formed below the levator ani muscle, the abscess is superficial; when above, it is deep.

The varieties of superficial abscesses are peri-anal, or marginal and peri-rectal, or ischio-rectal and the deep, or pelvic abscess. When pus has formed beneath the rectal mucosa it is known as intra-mural. Another variety in which the follicular and glandular elements of the skin and muco-cutaneous membrane at the anal margin become infected has been given the name tegumentary.

The treatment of abscesses about the rectum, regardless of the varieties they may assume, is purely surgical. By promptly detecting any indurated area, a patient may be saved complications that are apt to follow a serious operation and a long tedious convalesence. When induration is discovered, although the inflammatory process may not have gone on to the formation of pus, it should be treated as an abscess by incision and drainage. In all cases of brawny inflammation the process is much greater than it appears.

When the abscess is a marginal one it is treated by incision, evacuation, irrigation of bichloride of mercury solution, drainage with iodoform gauze pack and antiseptic poultice. When of the ischio-rectal variety an incision is made parallel with the radial folds and another at right angles to this, all pockets and septa broken down, curetted, cauterized with the actual cautery, irrigated with bichloride solution, packed with iodoform gauze and covered with antiseptic gauze and a T-bandage applied. It is absolutely essential that all the compartments that go to make up this space are broken down, otherwise the treatment will end in failure. The wound is redressed daily until all pus has disappeared, when the patient can be seen at less frequent intervals—from forty-eight to seventy-two hours will suffice. The sphincter muscles should always be divulsed after the cavity has been cleaned out.

Intra-mural and pelvic abscesses are likewise treated by incision and good drainage, although the last named is the most serious of all rectal abscesses, and only by the greatest of skill can the case be brought to a favorable issue.

The tegumentary abscess requires but a slight cut; and the application of crude Carbolic acid or pure Ichthyol introduced to the bottom on an applicator will cure the condition. They can frequently be aborted by applying locally to the infected area pure Ichthyol, or equal parts of tincture of Iodine and Alcohol. The preventive treatment consists in the use of proper detergent material, for which purpose absorbent cotton cannot be improved upon, and the frequent bathing of the parts with soap and warm water.

### Foreign Bodies in the Rectum.

The removal of foreign bodies from the rectum often requires great ingenuity; the manner in which this is accomplished must vary according to the size and the nature of the offensive body. Foreign bodies lodged in the rectum may come from within or without, either by accident or design. Children, perverts, and the insane frequently thrust objects of considerable size into the rectum. When the object is a sharp one and is swallowed, the patient is requested to partake of a diet with large residue, as potatoes and bread, into which the article will most likely be incorporated, thereby protecting the walls of the gut. If it becomes imbedded in the rectal mucosa or is too large to pass the external sphincter, its dislodgment and removal is sometimes made possible with the finger. When this fails general anæsthesia should be administered, the muscles thoroughly divulsed, and the article removed either with the fingers or any instrument that is suitable to grasp it.

Objects introduced from without are treated in the same manner as that just described. Dilatation does not always give sufficient room for their removal, in which event the rectum is divided posteriorly in the median line back to the coccyx. All lacerations and abrasions that may have occurred should be treated antiseptically

### Fæcal Impaction.

The removal of impacted fæces within the rectum is sometimes a difficult procedure. When the accumulation is located low down in the rectum and is small and not too hard, an enema of olive oil or hydrogen peroxide, three ounces to the pint of warm water to be retained as long as possible and repeated every four to six hours, will usually soften the mass and permit of its evacuation. When these ordinary methods fail and the impaction is high up, the patient should be anæsthetized, the sphincters divulsed and the mass broken up and removed with Kelsey's rectal spoon, Currier's forceps, a dull uterine curette or the handle of an ordinary tablespoon. When the patient refuses an anæsthetic, access can be had to the rectum with the bivalve speculum. Great care should be exercised in using instruments for this operation lest serious damage be done to the rectal wall.

If the sigmoid flexure is the seat of impaction, high enemas through a long Wales's bougie should be given with the patient in the knee-chest position. Massage, when carried out intelligently, will often dislodge and force downwards impaction in the descending colon and sigmoid. These methods failing, colostomy or sigmoidostomy must be resorted to.

After the impaction has been removed, the rectal mucosa as well as the sigmoid and colon should be treated with copious injections of normal salt solution and the bowels regulated with saline laxatives or Castor oil.

### Anal Fissure or Irritable Ulcer.

This lesion is located at the junction of the skin and mucous membrane, usually in the posterior half.

In considering the treatment of this distressing disease, it is gratifying to state that there is no surgical disease that responds more readily to operative interference than this one. A speedy cure can be effected by making a straight incision through the base of the ulcer of sufficient depth to sever the underlying fibers of the external sphincter muscle, and long enough to include about one-half inch of skin in the cut. Any overhanging or indurated edges of mucous membrane or skin are scissored off, as well as a sentinel pile, and when any complications exist, as a polypus, papilloma, etc., their removal is essential. Every second or third day the wound is cleansed and stimulated with bichloride of mercury solution and iodoform powder. This operation can be performed painlessly by the injection of a local anæsthetic beneath the base of the ulcer, but it is unquestionably more satisfactory, both for the patient and the physician, when a general anæsthetic is given and the recumbent position is enjoined for a few days following the operation. The bowels should receive careful attention, particularly while the wound is healing. A good plan is to encourage the patient not to have a movement for forty-eight hours after the operation, at which time an enema of warm water, followed by an injection of five ounces of olive oil is given. This should be retained as long as possible, and, after the bowel has emptied itself, the wound is redressed in the same manner as above stated. After the first action of the bowels they should move regularly, one soft motion daily being desirable, but this will be found a very difficult matter to accomplish, as most patients who are the victims of this lesion, are and have been chronically constipated for months and sometimes years. Any one of the following remedies are useful to regulate the number and consistency of the stools: Castor oil, fluid extract of Cascara, either alone or with malt; Phosphate of Soda, compound Licorice powder, confection of black pepper and Senna, equal parts; Olive oil, Hunyadi and Carabana waters. It is necessary to experiment with each patient as to the amount of laxative to be given, for what may produce a severe diarrhœa in one, may have absolutely no effect upon another. Occa-

sionally these agents fail, when the use of an enema of water, either alone or with soap suds or glycerin, is necessary. A diet consisting of milk, cream, soups, eggs, farinaceous foods, fruits, in fact all articles of food that are known to have no constipating or diarrhœal effect, should be indulged in, and the ingestion of much water may aid materially in softening the intestinal contents.

Divulsion as a means of curing anal fissure has won much favor, because it is a non-cutting operation, no instruments whatever are required for its performance, and little, if any, after-treatment is necessary. In these respects this method has no equal, and were it not for the fact that its usefulness is limited to carefully selected cases only, it is doubtful if any other operation would be employed. Unfortunately, however, in only those cases where the fissure is of recent occurrence, without hypertrophied muscles, indurated edges and base and uncomplicated, should it be attempted, otherwise failures will frequently follow, and an excellent method, when scientifically used, will thereby be brought into bad repute.

The technique of divulsion is as follows: Having trimmed closely the nails, the index and middle finger of each hand are well lubricated and introduced within the anal canal one at a time until all four can be readily admitted, or when the thumbs are used, as is preferred by some surgeons, they are made to enter back to back. Begin by stretching the muscles antero-posteriorly, then laterally and finally in every direction, dilating more each time until the muscles are felt to be giving up, so to speak, when further stretching should not, under any consideration, be attempted lest irreparable damage be done, as permanent incontinence has been known to follow the too energetic stretching of these muscles. Frequently the mucous membrane cracks in various places, and while these abrasions are of no consequence, nevertheless it is advisable to protect them with Iodoform or Aristol powders. The frequent application of water, hot as can be borne, to the parts will be found very soothing to the patient and will aid in the absorption of any extravasation of blood that may have occurred from the rupturing of minute bloodvessels at the anal margin; otherwise no after-treatment is required. In some male subjects it requires all the strength that the operator possesses to overcome the resistance of the external sphincter muscle, but in the opposite sex the musculature is not nearly so well developed, which, for obvious reasons, is worth remembering.

For the benefit of patients who are unalterably opposed to operation, however slight it may be, recourse may be had to local applications, although it is never advisable to undertake this line of treatment unless obliged to and not until the patient has been informed of the probable failure of effecting a cure by this means. A conical fenestrated speculum is introduced within the anal canal and the slide is removed when the fissure in its entirety is in full view. Having anæsthetized the ulcer with any one of the

local anæsthetics, preferably Anæsthecine, which is insufflated over its surface, a pledget of cotton saturated with pure Ichthyol is applied to the diseased spot. This is repeated every two or three days, and if at the end of three or four weeks the fissure has not healed, it is almost certain that it never will until more radical measures are undertaken. Other agents that have given satisfaction are Argyrol, Balsam of Peru, Lignol, Iodoform, Bichloride of mercury and Silver nitrate, either in stick form or in solution. These drugs can be applied without the use of the speculum, but better results are obtained with this instrument because of its dilating effect upon the tightly contracted external sphincter muscle, which relieves to some extent its irritability. The bowels should receive the same attention during the healing process as advised following operation.

## Ano-Rectal Fistula.

Fistulæ in the ano-rectal region invariably owe their origin to abscess. The only hope of avoiding this unfortunate sequela is free incision during the early stages of the abscess, in the presuppurative stage if possible ; thus the importance of an early operation cannot be overestimated.

A fistula is said to be complete when there is an opening through the skin external to the anus and an internal opening through the mucous membrane within the bowel.

An incomplete fistula has but one opening, either in the skin or mucous membrane. The former is known as blind-external, and the latter blind internal, although, technically, both are merely sinuses.

The so-called horseshoe fistula is one in which an external opening on either side of the anus communicates with an internal opening, usually in the posterior wall of the bowel.

When fistulæ are spoken of as simple, the tract is shallow and straight; when complex, the tract is tortuous with one or more branches leading off from the main channel and the existence of two or more openings in the rectum with one upon the skin, or vice versa; when complicated, the infection originates from necrosed bone, or there are connections with other organs, namely, the uterus, vagina, bladder and urethra and are classified as recto-uterine, recto-vaginal, recto-vesical and recto-urethral respectively.

To be successful in the treatment of this disease, it is absolutely essential that the cartilaginous-like membrane lining the fistulous tract be destroyed and healthy granulations induced. The principal methods by which this can be accomplished are described as conservative and radical. Under conservative treatment, the two methods that have given the best results are injections of escharotics or astringents and scarification, while the radical treatment includes incision and excision.

**Injection.**—The tract is first cleansed with hot water or hydrogen peroxide and a 10 per cent. solution of Cocaine deposited in the channel to obtund its sensibility, after which the interior is curetted with a wire curette. With a silver canula attached to an ordinary hypodermic syringe charged with either Silver nitrate (saturated solution), Carbolic acid (from 50 per cent. to the crude drug), Ergotine, or the tincture of Iodine, this instrument is passed within as far as possible and then slowly withdrawn and the agent gently forced out of the syringe at the same time. After the lapse of a minute or two the fluid is pressed out and mopped up, care being taken to protect from the action of the chemical the adjacent skin, which should have previously been smeared with an unguent. The final step of the operation consists in enlarging the opening, which can be done either by dilatation or by making a transverse incision; and by gently dilating the sphincter muscles with dilators or the fingers, or if nitrous-oxide gas is administered, thorough divulsion is more satisfactory. Should more than one application be required, the injection is repeated in from two to three weeks, and if at the end of six or eight weeks the discharge continues and the sinus shows no signs of healing, radical measures should be undertaken. The after-treatment consists in preventing the opening from healing until all discharges have disappeared and the sinus has healed (a point that cannot be emphasized too strongly), and cleanliness of the parts with ordinary antiseptics. The patient should be instructed to rest in the recumbent position as much as circumstances will permit, and to abstain from all active exercise. Tonics should be prescribed, as Cod liver oil, Olive oil, Iron, Strychnine, Quinine and malt preparations.

**Scarification.**—This operation can be performed either with a blunt-pointed tenotone or Mathews' fistulotome. The fistulotome is probe-pointed, with two concealed knives. The instrument is passed as far into the sinus as possible and on its withdrawal the blades are uncovered by the screw attachment at the end, thereby incising or scarifying the lining membrane of the channel. This is repeated several times, the instrument to be reinserted in such a way that the cutting will be on the opposite side. The after-treatment is the same as that described above.

The simple introduction of a probe into the fistula will occasionally excite healthy granulations, sufficient to completely obliterate the tract. Two such cases came under the writer's charge. The fistulæ were probed, not as a means of cure, but to determine their depth; operations were advised, to which both patients consented. Owing to business engagements, however, the time for their performance was deferred until a later date. On re-examination, this surprising outcome was discovered. The fistulæ were of the blind external and simple complete varieties.

While it is true that many cures can be obtained by conservative treatment, yet this method is applicable only to the simplest forms of fis-

tulæ, and even then a favorable outcome is uncertain, of which fact patients should be so informed.

**Incision.**—The operation of incision has won superiority over that of excision because of its comparative simplicity, and that it unquestionably yields better results. Having prepared the patient by a thorough emptying of the bowels with a suitable laxative and enemata, the sphincter muscles are divulsed and the operative field cleansed with carbolic solution. A grooved director is passed into the fistula and through the internal opening, when the point of the instrument is brought out through the anus. The back of a sharp-pointed bistoury is forced along the groove of the director until all overlying tissues are severed. When the fistula is a deep one and the intervening tissues include the external sphincter, the incision is made at right angles to the fibres of this muscle. The next step and perhaps the most important is to examine most thoroughly for lateral sinuses and diverticula, and if any are found, they require opening. The tract is finally scarified or cauterized with the actual cautery and all indurated or overhanging edges are excised. The operation is completed by packing the cavity with iodoform gauze, over which plain gauze saturated with bichloride of mercury is placed, the dressings to be retained with a T-bandage.

When there is apparently no internal opening of a fistula, but the grooved director can be felt in the submucosa, it should be thrust through the mucous membrane between the sphincters and the case treated as a complete fistula. Should there be found a sinus extending for a considerable distance above the internal opening of a complete fistula, if superficial, the tract should be incised; if deep, cutting should be resorted to; the frequent application of antiseptics will ordinarily cause it to heal.

Blind internal fistulæ should be made complete by forcing a grooved director through the skin, when the sinus is divided from above downward with a curved blunt bistoury, otherwise the treatment is the same.

The treatment after operation should be carried out most rigidly. Daily, the wound is cleansed with peroxide and bichloride and lightly packed with iodoform gauze until healthy granulations have appeared. The cut must heal from the bottom, and, when bridging occurs, the adherent walls are separated by passing a probe through the intervening tissue. This precaution must be strictly adhered to, otherwise a sinus will form and recurrence of the original condition will necessarily follow.

The method of excision with immediate suture is occasionally practiced when the fistula is of the blind external variety and located well away from the anal orifice. The fistulous tract is dissected out in its entirety and the wound closed with subcutaneous sutures of chromic gut. Difficulty in preventing sepsis of undrained wounds in the anal region is the great objection to this operation.

Horseshoe fistulæ are treated by incising the channel on one side and dilating and draining the other.

Operations for the radical cure of fistula are contra-indicated when the patient is in the advanced stages of phthisis, Bright's disease, diabetes, organic heart disease, or when there is malignancy higher up. When due to stricture of the rectum, operation for fistula should never be attempted. The patient should be made as comfortable as possible by keeping the fistulous openings well drained and the parts clean.

## Rectal Prolapse.

There are two distinct varieties of rectal prolapse—incomplete or partial, also termed prolapsus ani—in which the mucous membrane alone protrudes, and complete or prolapsus recti, also called by some authors procidentia recti, where all the coats of the bowel are involved in the descent—mucosa, submucosa, muscularis and peritoneum (especially anteriorly). It is readily understood that, when the serous membrane descends into the peritoneal pouch thus formed, there may herniate intestine or omentum.

When invagination or intussusception occurs, the intussusception may protrude from the anus to such an extent to hang down between the legs.

The treatment consists in the reduction of the mass and its retention, whether by non-operative or operative means.

Reduction is accomplished by placing the patient, if a child, prone across the lap with an assistant separating and elevating the limbs ; or, if an adult, either the knee-chest or lateral position, with the hips well elevated. Having first cleansed the parts with a mild antiseptic, and well lubricated the prolapse, it is replaced by gentle taxis, after which the nates are held in apposition with adhesive strips applied anterior to the anus and extending from one trochanter to the other. When applied anteriorly, the adhesive plaster will not become soiled with fæces and its reapplication will necessarily be less frequent (once in a week or ten days will be sufficient) ; thus irritation and ulceration of the underlying skin caused by its removal at every motion will be prevented.

Postural defecation, either in the Sims or erect position will guard against straining, and should therefore be insisted upon ; also, pressure upon either side of the anus during defecation will serve as an excellent means of support to the relaxed wall.

Frequent applications such as stimulate contraction of the sphincter muscles and retraction of the prolapsed gut should be administered. For such purposes, cold water, tannic acid and alum are very useful. Cold water enemata given prior to a bowel movement will soften the fæcal matter and prevent straining.

If the protrusion is an acute one, with much congestion and the

sphincters are tightly contracted, a mild solution of Cocaine, or Adrenalin sprayed upon the parts, or the application of a 25 per cent. solution of boro-glyceride may decrease the swelling to such an extent as to permit of its reduction. This failing, general anæsthesia should be administered, the sphincters divulsed and the extrusion replaced.

The next step is to determine and remove the cause if possible. If due to phimosis, urethritis, stricture of the urethra, cystitis, enlarged prostate, ulceration, foreign bodies in the rectum, hæmorrhoids, polypi, thread worms, constipation, diarrhœa, constitutional debility, exhausting diseases, dysentery or pertussis, it is necessary that it should be eliminated. Another frequent cause is the straining at stool of children, who are often illy-advised, through ignorance on the part of the mother or nurse, who allow them to assume the squatting posture upon a chamber utensil for long periods after the bowels have moved. This should absolutely be prohibited.

Children can often be cured by the administration of tonics, regulation of the bowels, cold applications and electricity applied to the anus and general hygienic measures. Schmey claims that the majority of cases of prolapsus occurring in children may be permanently cured by the administration of the following:

℞ Phosphor., . . . . . 0.01
Ol. jecoris aselli, . . . . . 100.00
Ft. sol.
Sig.—Two to ten minims according to the age of the child, three times daily.

Phosphorus in some form, Strychnine, Hypophosphites, Cod liver oil, and Arsenic are all useful in the treatment.

In the old and feeble, when operative measures are contra-indicated, the application of a support somewhat similar to a truss fastened to a belt by straps will be found a very useful contrivance in keeping the prolapsus up.

The operative methods are: linear cauterization of the mucous membrane, either with the galvano-cautery knife, or fuming Nitric acid; cauterization of the entire surface of the prolapse with fuming Nitric acid; submucous injections of the hæmorrhoidal compound; partial or complete excision and rectopexy.

*Linear Cauterization.*—The mucous membrane is drawn down in its entire circumference and linear sears are made in the longitudinal axis of the gut (6 or 8 in number). When healing and contraction have occurred, the process can be repeated as often as may be necessary. The prolapse is returned and held in place in the same manner as above stated, as well as postural defecation and local applications.

When Nitric acid is substituted for the actual cautery in the operation of linear cauterization, or in applying the acid to the entire surface of the

prolapsus, as recommended by Allingham, a glass rod should be used. The skin surrounding the anus is protected with Vaseline, and any excess of the cauterizing agent is antidoted with a saturated solution of Soda bicarbonate.

Injection consists in the introduction of the hæmorrhoidal compound into the submucosa at various points (3 to 5 in number) in the circumference of the prolapse.

A rubber drainage tube wrapped with gauze is then introduced into the rectum for the purpose of supporting the weakened wall, the tube serving as an avenue of escape for gas. This packing should remain *in situ* for at least one week, during which time the bowels are controlled by the frequent administration of opiates and the administration of a diet giving small fæcal residue.

*Partial excision* consists in the removal of small elliptical pieces of mucous membrane in the circumference of the prolapse, either with the scissors followed by immediate suture, or by grasping the mucosa with the hæmorrhoidal forceps and clamp, excising and cauterizing these portions in the same manner as described for the removal of hæmorrhoids by the clamp and cautery. The lines of sutures to wounds in this region almost invariably become infected, and for this reason the clamp and cautery method is to be preferred.

Complete excision, or the method of Delorme, consists in circumcision at the muco-cutaneous junction, stripping the mucous membrane as a cuff to the apex of the protrusion, where it is divided and removed. This new mucous border is then sutured to the cutaneous edge after the protrusion has been reduced and holds it up.

*Rectopexy.*—To avoid the peritoneal pouch in front, a slightly curved incision is made across the top of the coccyx, the prolapse is drawn through this and several sutures passed transversely through it. The ends of the sutures are introduced through the wound and brought out higher up on either side of the sacrum and tied. The lower portion of the rectum is drawn up and anchored high enough to prevent recurrence.

## Proctitis, Ulceration and Stricture.

*Proctitis.*—The varieties are acute and chronic.

The most common causes are wounds, contusions, foreign bodies, impacted fæces, chronic constipation, irritating diarrhœa (either during the course of acute infectious diseases, the injudicious use of drastic purgatives, or from food that has undergone putrefactive changes); prolapsus, polypi, hæmorrhoids, pin worms, effects of rectal operations, the rough and too frequent introduction of the syringe nozzle, exposure to cold, the practice of sodomy, either by mechanical irritation during the act, or the result of contagion, although septic germs more commonly gain access to the rectum from gravitating vaginal discharges.

The treatment varies according to the cause, which should always be discovered if possible and corrected. In the acute variety, irrigations with mild astringents and antiseptics, such as Hydrastis, Hamamelis, Tannic acid, Nitrate of silver, Boracic acid and Permanganate, in aqueous solutions, are called for. Injections of glycerin into the rectum are irritating to the mucous membrane, and are, therefore, more harmful than useful. When the symptoms are hyper-acute, with much tenesmus, pain and spasmodic contraction of the sphincters, such remedies with anodyne properties in a mucilaginous medium are called for. In any case where these symptoms persist, either divulsion or complete division of the external sphincter should be performed.

Rest in the recumbent position should be insisted upon, and either a liquid or semi-solid diet, according to the severity of the case, should be prescribed.

In chronic cases it is frequently necessary to combine a more deeply-acting agent, such as Ichthyol or Iodoform in suppository form, or injections twice weekly of Balsam of Peru, 5 per cent., in Castor oil, or of an emulsion compound of Bismuth, ℥ss.; iodoform, ℥ss.; Olive oil, Oj.

Inasmuch as there is frequently an associated proctitis with any form of ulceration of the rectum, the treatment of the latter will be outlined at this time. When the ulcer is a simple one, the rectum should be irrigated with mild antiseptic solutions every other day, although under some circumstances it is well to cleanse the rectum daily with weak Carbolic acid solutions through a return irrigation, care being taken that the rectum is emptied of the antiseptic after each douching. It may be necessary also to add to the antiseptic in suppository form: Iodoform, grs. iij; Subnitrate of Bismuth, grs., v., and Morphia sulph., gr. $\frac{1}{10}$—or Ichthyol, grs. v., with Cocoa-butter.

Applications through a speculum of an escharotic or stimulating drug, as Nitric acid, Carbolic acid, Balsam of Peru, Silver nitrate, Argyrol, Lignol and compound tincture of Iodine, are called for in some of the more severe forms of ulceration. The applications should be made not more than every other day, lest too much irritation be produced by the introduction of the speculum.

Chancroidal ulceration of the rectum is rather a rare disease in America. The mode of infection is either by the practice of sodomy or from gravitating vaginal discharges. The treatment of this form of ulceration is practically the same in this locality as elsewhere. Its thorough cauterization with fuming Nitric acid by means of an applicator until a healthy surface appears, to be followed by stimulating and antiseptic washes until a cicatrization takes place, is the proper course to pursue in this form of ulceration.

When the ulceration is due to constitutional disease, the treatment is

largely medical, and should be directed toward the primary disorder. The local treatment has for its object good drainage, the protection of surrounding structures, cleanliness and stimulation. Syphilitic ulceration, when found about the anus, is usually one of its early manifestations. When found higher up, it is more often a tertiary lesion or gumma, which breaks down and cicatrizes with resulting stricture.

When the ulcer is confined to the anal margin, the parts are kept clean by Carbolic acid washes to apply twice daily and the application of either Lotio-nigra, Calomel and starch, 1 : 5, or an ointment of Ammoniated mercury. The ulceration should be covered with a pledget of cotton, for the purpose of protecting the surrounding parts. Antisyphilitic treatment should be rigidly enforced.

The local treatment of tertiary syphilis in this locality consists of functional rest of the rectum by carefully regulating the bowels ; scarification of the ulcer either with the electric thermo-cautery or other cauterizing agents and antiseptic irrigations. When the discharges become foul drainage should be provided by gently dilating the sphincters and the introduction of two small drainage tubes as advised by Tuttle, or division of the sphincter. In severe cases, it may be necessary to perform linear proctotomy or even a colostomy.

### Tubercular Ulceration.

This form of ulceration is most frequently found as secondary to the disease in other organs, and is often undiscovered until excessive destruction has taken place.

In its early stages the treatment should be directed toward the general improvement of the health of the patient by the administration of antitubercular remedies, together with good hygiene and suitable diet.

Locally, cleanliness of the seat of the disease and the use of Iodoform suppositories is the appropriate treatment. In the later stages of the ulceration, when marked destruction has occurred, with fœtid discharge, they may be gently scraped out, cauterized, dusted with Iodoform and the rectum kept clean by judicious flushings with mild antiseptics.

### Fibrous Stricture.

In severe ulceration about the rectum when cicatrization has taken place, more or less stricture formation occurs, except when the process is tubercular, which is more apt to remain an open wound followed by fistula than stricture.

The character and treatment of strictures varies according to the area involved, and may be described under two methods—dilatation and operative.

Dilatation is carried out by the use of rectal bougies ; those of Crede, Wales, Andrew and Hagar are to be recommended. In their in-

troduction great care should be exercised to prevent wounding the wall of the rectum. A small sized bougie is passed first, followed by a larger one each time until the largest that can be made to enter without pain has been inserted. Where possible the proctoscope should be used to determine the position of the opening in the stricture, as it is sometimes most difficult to insinuate the bougie without the aid of the eye. The length of time that the bougie should remain in the stricture varies from one to several hours, according to its calibre and character. Well lubricating and warming the instrument, also keeping in mind the normal curves of the rectum in passing it are essential things for the success of this method.

The operative methods most commonly in use are linear proctotomy, colostomy, and complete extirpation.

## Pruritus Ani.

The chief characteristic feature of this affection is itching of the ano-gluteal region. This distressing, tormenting, intolerable and maddening symptom usually comes on while the patient is in bed and may be so persistent as to render rest and sleep impossible until the patient is thoroughly overcome from exhaustion. Indeed, so severe may be the itching that patients have remarked that pain would be an actual pleasure.

In treating pruritus ani, a thorough examination, both externally and internally, should first be made to ascertain the cause of the itching, and if any abnormal conditions exist they require appropriate treatment; at the same time, for the relief of the itching, applications to the ano-gluteal region of a soothing lotion, unguent or powder, preceded by applications of water, hot as can be borne, are called for.

If the itching be due to pediculi, mercurial ointment will effect a speedy cure; if to thread-worms, lime water injected into the rectum followed by a brisk purge will afford great relief; this should be repeated, if necessary; if to fungoid parasites, which can be detected only with the microscope, black wash, sulphurous acid and iodine in varying quantities and strength adapted to the case should be locally applied. When the irritation is due to a simple chafing of the parts, a dusting-powder of sub-nitrate of bismuth, prepared chalk and starch will cure the case.

In many cases of pruritus there will be found a shallow ulcer located usually posteriorly and between the two sphincters. The ulceration may be single or multiple, and can be detected only by a most thorough examination. The ulceration is treated by first divulsing the muscles, cauterizing the ulcer with the electric-thermo cautery, regulating the bowels and applying to the skin at the anal verge, Resorcin ointment, 10 grains to the ounce.

Wallis, of St. Mark's Hospital, London, detected this ulceration in 90 per cent. of cases of pruritus within the past seven years. In a series

of cases treated in hospital and private practice, the writer was able to demonstrate the presence of the ulcer, and by curing it, the itching ceased.

## Rectal Neoplasms.

Tumors of the rectum are either benign or malignant.

Benign growths are, in the vast majority of instances, attached to the rectal wall by means of a pedicle, and all pediculated neoplasms have been termed polypi.

The pedicle may be long or short, broad or narrow, and the growths may be single or multiple. Fibromata, adenomata, papillomata and lipomata are the most common of polypi. Their size varies from a pea to a hen's egg, and their consistency, whether soft or hard, is in proportion to the relative amount of fibrous tissue entering into its formation.

The treatment consists in the removal of the growth, which is accomplished by snaring off the growth with an ordinary rectal snare, or by applying a ligature to the pedicle, after which the tumor is either excised or allowed to slough off. Another plan is to anæsthetize the patient, apply a clamp or hæmostat to the pedicle and burn through it with the galvano-cautery. When the pedicle is broad at its point of attachment to the rectal wall, it should be excised by means of an elliptical incision through the mucosa, and the wound sutured with fine catgut or cauterized with the hot iron. The entire removal of the tumor is very important, especially if papillomata or adenomata is suspected, for recurrence in a more malignant form is apt to follow if this precaution is not adhered to.

Should the growth be attached to that part of the rectal mucosa which is invested with peritoneum, a heavy catgut suture should be applied to the pedicle to prevent opening the peritoneal cavity. No after-treatment of the wound is required, but the rectum should be irrigated once daily with antiseptics and the bowels regulated.

Multiple polypi are, as a rule, adenomatous in structure. Their removal is best accomplished by excising the pedicle with the galvano-cautery through a proctoscope, the growth to be steadied with a fine hook.

Villous tumors of the rectum are considered by some pathologists malignant, isasmuch as the microscopical examination shows them to resemble carcinoma, and in that they frequently recur after removal but in a more serious form. In treating this type of tumor, because of its suspected malignant nature, the growth calls for thorough removal. It is readily understood for the reasons stated that villous tumors should not be ligated or transfixed, as neither method is sufficient to completely eradicate the growth.

In the writer's opinion, the removal of ordinary polypoid growths when the base is not too large or located too high up in the bowels is by the clamp and cautery method.

## Malignant Neoplasms.

Cancer of the rectum is one of the frequent diseases located in this region. They are either carcinoma or sarcoma, with the possibility of the villous tumor being included in this class.

The squamous or pavement-celled epithelioma occurs chiefly at the muco-cutaneous junction, where the epiblast dips in to meet the down-coming intestine or hypoblast, while the glandular variety, or columnar-celled carcinoma, occurs higher up. In epithelioma there occurs early numerous and extensive glandular metastases, in which case chains of glands will be found in the hollow of the sacrum and groin.

Clinically, these growths are largely confined to the anal margin and first appear as slightly nodular elevations, but when fully developed they resemble large cauliflower-like growths, which are characterized by indurated bases. These neoplasms are usually very painful and bleed profusely. They kill by sepsis and anæmia.

Columnar-celled carcinoma may be hard or scirrhus, soft or encephaloid. The former produces stricture, is slower in growth, with less ulceration, and little if any bleeding until late in its course, while the latter variety is not so apt to cause stricture, is more rapid in growth, breaks down readily, ulcerates extensively with profuse hæmorrhages. In either variety of columnar-celled carcinoma, metastasis is a late condition. Death occurs from bowel obstruction, due to stricture formation.

*Sarcoma.*—This embryonic connective-tissue type of tumor is of rather rare occurence in the rectum, although it is met with in greater frequency here than in any other part of the alimentary canal. It appears as irregular deposits beneath the mucous membrane; is usually round or elliptical in form; the mucous membrane is rather freely movable over the growth early in its course, which is a characteristic feature. Sarcomata may be either single or multiple, vary considerably in size, are comparatively hard, are located most commonly near the anal margin and their growth and metastasis are both very rapid. The varieties of this growth are giant-celled, spindle or fusiform celled, round celled, alveolar, and mixed. When there is a deposit of melanin in the tumor it is known as melanotic sarcoma.

The treatment of malignant growths of the rectum varies with the character of the tumor and its symptoms. The palliative operation of colostomy is indicated in those cases where extension of the disease is such that a radical removal is impossible, and when extensive metastasis has occurred; and for those in which the symptoms of bowel obstruction are so acute that a speedy relief must be obtained; also in cases where a prolonged operation cannot be undertaken because of the poor physical condition of the patient.

Colostomy not only relieves the impending bowel obstruction but also

diverts the fæcal stream from the rectum, which relieves the irritation and in this way tends to retard the increase of the growth. Patients having had this operation performed sometimes live indefinitely, but in all cases that have survived the operation, life has always been prolonged and the distressing symptoms relieved.

By the use of a hard rubber cup made to fit snugly about the artificial anus and properly cared for, they are made comfortable and suffer little inconvenience. In place of this cup, a rubber obturator may be substituted, though, as a rule, the former appliance gives the most satisfaction.

The after-treatment consists in careful irrigation of the bowel below the colostomy, attention to cleanliness of the skin about the artificial opening, and in those cases where there is an irritating discharge from the anus, the skin at the anal margin should receive like attention. The cup should daily be sterilized with boiling water, to which may be added soda-bicarbonate, and the adjacent skin about the opening dusted with a drying powder, such as Aristol, Stearate of Zinc, or Boracic acid. It is desirable that the fæces should be soft in consistency and that the bowels move once daily, which can be induced by choosing a carefully-selected diet, and the administration of olive oil in tablespoonful doses, t. i. d.

While it has been the writer's experience that in most of these cases the disease has been recognized late in its course, and that the palliative operation of colostomy has necessarily been resorted to, yet it is his belief that if the tumor be recognized early, before the surrounding structures are extensively involved and metastasis has not taken place, a thorough excision of the rectum should result in a permanent cure.

## Hæmorrhoids or Piles.

They are divided into the external and internal varieties.

When the tumors originate outside the external sphincter muscle, they are of the external variety. When above this muscle, they are internal. When the pile is covered with both skin and mucous membrane, it is called an externo-internal hæmorrhoid.

External hæmorrhoids may be either thrombotic or cutaneous; they are also named skin tags.

Thrombotic hæmorrhoids are best treated by immediate enucleation of the clot, although its absorption may be brought about by the application of hot fomentations to the anal region, with the patient in the recumbent position. The bowels should be regulated with mild laxatives, but never with drastic purges, and the pain is controlled by soothing applications, of which the following are recommended:

℞ Ung. stramonii, . . . . . āā ℥j.
Ung. belladonnæ,
Ung. acidi tannici, . . . . . ℥iv.
M. et ft. ung.

or

℞ Ext. suprarenalis, . . . . . ℥ij.
Ung. lanolini, . . . . . ℥vj.
M. et ft. ung.
S.—To be freely smeared over the parts.

Suppositories containing the opiates, Cocaine, Hyoscyamus, Belladonna, Atropine, Iodoform and Bismuth are also used with good effect to alleviate the pain. Allingham recommends the following :

℞ Bismuthi subnitratis, . . . . . ℥ij.
Hydrargyri subchloridi, . . . . . ℥j.
Morphinæ acetatis, . . . . . gr. iv.
Vaselini, . . . . . ℥j.
M. Sig.—Use freely as local application.

Goodsall and Miles recommend this :

℞ Liq. Plumbi subacetatis . . . . . ℥ss.
Spts. Vini Rectificati, . . . . . ℥j.
Glycerini, . . . . . ℥ss.
Aquæ Rosæ, . . . . . ℥x.
Sig.—To be continually applied to the parts.

Should these methods fail to bring about absorption, operation is called for. The technique is as follows : The parts are first thoroughly cleansed and the pile anæsthetized with any of the local anæsthetics. With a small sharp-pointed curved bistoury, the tumor is transfixed at its base and the knife allowed to cut its way out. All clots are removed with the tissue forceps or curetted, and the bleeding stopped with hot applications and pressure. The cavity is then packed with Iodoform gauze to prevent further bleeding and to keep the edges of the wound from uniting until all oozing ceases ; the usual time for its removal is forty-eight hours. Plain gauze held in place with a T-bandage constitutes the outside dressings.

To prevent successive attacks of thrombotic piles, the patient should be informed as to the cause of this trouble so that straining, either at stool, in lifting heavy weights, or in violent coughing can be guarded against.

Frequently thrombotic piles are converted into abscess or fistula, in which event they should be treated accordingly.

Skin tags can be removed in a painless manner under local anæsthesia. The redundant skin is grasped with a hæmostat or tissue forceps and excised at its base. The bleeding is sometimes quite profuse after its removal, but hot compresses and suprarenal will readily control the hæmorrhage. Iodoform powder is dusted over the stump and plain gauze and T-bandage applied. Care must be exercised not to remove too much tissue when the tumors are large and swollen, as much pain, long convalescence and stricture may result.

In both varieties of external hæmorrhoids, the after-treatment con-

sists in rest as much as possible, regulation of the bowels and cleanliness of the parts.

Occasionally the anal folds become inflamed and swollen, and are described by some authors as inflammatory external hæmorrhoids, also œdematous piles. Their treatment consists in subduing the inflammation by local applications or in their removal. The patient should assume the recumbent position, and the parts smeared with a 25 per cent. solution of Boro-glyceride, over which gauze and a hot-water bag are placed.

If operation is resorted to, the patient should be anæsthetized, the sphincters divulsed, the inflamed pile scissored off or crushed with the clamp, and if any associated rectal diseases are found they should be corrected at the same time.

### Internal Hæmorrhoids.

The varieties are venous, arterial and capillary.

The treatment may be either palliative or operative.

Palliative treatment consists in arresting hæmorrhage and preventing prolapse of the piles.

To arrest hæmorrhage the patient should rest in the recumbent position, cold applications made, injections into the rectum of Hydrastis and Hamamelis equal parts, or suprarenal extract, or Iodoform applied to the protrusion, or used in suppository form when the piles do not protrude. Having stopped the flow of blood, a recurrence should be prevented by regulating the diet and bowels. Alcohol, coffee and tobacco should be modately indulged in, if at all. Moderate exercise and plenty of sleep are to be enjoined. The bowels are regulated by the administration of any of the mild laxatives. Olive oil, in tablespoonful doses, t. i. d., is to be especially recommended; also cold water enemata.

When prolapse occurs, it should be first cleansed and smeared over with the tannic acid, stramonium and belladonna ointment. This unguent is also useful when applied to the rectum by means of a pile pipe at the time of stool and when going to bed. If there is much spasm of the sphincters great relief can be obtained either by the occasional passage of a full-sized rectal bougie, to remain in place for five or ten minutes, or by complete divulsion of the sphincters under nitrous oxide gas.

**Injection Method.**—This method is now applied to simple, uncomplicated, varicose internal hæmorrhoids, and before undertaking it, the patient should be informed of the length of time required for its performance and that recurrence is apt to follow.

The technique is as follows: Having previously divulsed the sphincters some three or four days previously and having unloaded the bowels with a purge, an enema is given first prior to the operation to cleanse the rectum and also to bring down the piles. The one to be injected is selected (usually the largest and the one that causes the most trouble) and cleansed

with a mild bichloride solution. With the patient in the lateral position, and the pile supported with the left index finger pressed against its inner wall, the needle attached to an ordinary hypodermic syringe containing from ten to fifteen minims of the solution to be used is thrust into the pile at its base, but not into the rectal wall, and the fluid is slowly inserted drop by drop until the tissues become blanched. The needle is then partially withdrawn and introduced into the apex of the pile where the remainder of the fluid is deposited. A pledget of cotton saturated in alcohol is placed around the needle to protect the mucosa from the action of the acid, some of which will ooze out upon the complete withdrawal of the needle. In the larger hæmorrhoids it may be necessary to repeat the injections two or more times, but the smaller ones usually require but one application. The operation should not be performed oftener than twice in a week, and more than one hæmorrhoid should not be injected at one sitting. After the fluid has been introduced within the pile and the needle is withdrawn, the tumor is not replaced within the rectum for a few minutes, in which time the fluid will be given time to disseminate. When the pile is so small that it cannot be made to protrude, it is injected through a conical speculum which has previously been introduced. No after-treatment is required unless the patient has much pain, when hot fomentations to the parts will be found soothing. If this is not sufficient to relieve the pain, Opium and Belladonna suppositories, one to be introduced every two hours if necessary, will be effective.

The bowels should be confined for two or three days following an injection, after which either a mild laxative or cold water enema is given. Should there be a prolapse of the injected pile, the patient is instructed to replace it by gentle pressure with a wad of cotton or gauze, or better, the physician should be sent for to do so.

The fluids that have been recommended for the injection of hæmorrhoids are too numerous to mention, but in all of them Carbolic acid is the principal ingredient. Dr. Hoyt's solution of equal parts of Hamamelis and water mixed together, to which is added Carbolic acid in the proportion of one in ten parts, has given the writer the best results. The Carbolic acid is not soluble in the other agents and remains in the state of suspension in fine globules, therefore the bottle must be well shaken before using.

The application of Nitric acid to capillary hæmorrhoids which bleed on the slightest provocation, is a most useful method of arresting the hæmorrhage and destroying the pile, although two or more applications may be necessary. A conical fenestrated speculum is introduced and the slide withdrawn. The pile is wiped dry and the acid is applied over its surface by means of a glass or wood applicator. When the tumor has been thoroughly attacked by the action of the acid, it and the surrounding parts are washed with a saturated solution of Soda bicarbonate. The skin at the anal margin

should be protected by smearing it with Vaselin before introducing the speculum.

The application of the electro-cautery is a better means of exterminating the pile than by the use of the acid. It is performed in the same manner as above described.

The radical operations for hæmorrhoids are clamp and cautery, ligation and excision of the pile-bearing inch.

# CHAPTER XI.

## FEEDING IN INFANCY AND CHILDHOOD.

By C. Sigmund Raue, M.D., Clinical Professor of Pædiatrics, Hahnemann Medical College of Philadelphia.

The subject of infant feeding can be approached most rationally by a few prefatory remarks upon **Metabolism** in childhood. First of all, we must remember that the process of nutrition in a growing organism is different from that observed in the fully matured organism. The child continuously adds new cells to its economy, while in its habits and in the range of many important physiological functions there is a vast difference between the child and the adult. For this reason, the process of nutrition must show peculiarities of its own.

The adult is normally in a state of "nitrogen equilibrium," that is, he excretes exactly as much nitrogen in the urine and in the fæces as he takes into his alimentary tract with the food. Besides, there is also a normal "carbon balance," so that the body-weight neither increases nor decreases, but fluctuates within very inconsiderable limits. When the adult gains weight he does so by putting on fat; in other words, there is a carbon retention in the organism. This is possible under almost all circumstances, but in order for the adult to put on actual muscle, *i. e.*, in order for him to retain nitrogen, he must either take considerable exercise and thus increase the size of his muscles, or he must be in a condition of partial starvation. Patients who are underfed or who are convalescing from some acute illness or suffering with a wasting disease, may under proper feeding be made to retain nitrogen. This is proven by the fact that they gain weight on a diet rich in proteids, and that the amount of nitrogen recovered in the urine and fæces is below that taken in the food. As soon, however, as they attain their nitrogen equilibrium this retention of nitrogen ceases and the excess is oxidized in the system, some of it being converted into fat. The function of proteids in the adult economy is, therefore, to supply the necessary pabulum for the repair of tissue waste, for glandular function, and to a certain extent for the production of heat.

In the child, on the other hand, proteid food is absolutely essential for the production of new cells, called for by the rapid growth and development of the organs and various tissues. For this reason a relatively large amount of proteid is needed, but owing to the immature condition of the digestive tract it must be in a form that can be digested readily. Fat and carbohydrates are needed for the production of body heat. The carbohy-

drate in the infant's natural food is found in the form of lactose, and being the most readily assimilable food-stuff it comes most prominently into play. Fat, however, can never be replaced entirely by carbohydrate, for fat is not only a heat producer and a reserve food, but it appears that without a certain amount of fat in the dietary the nutrition of the protoplasm itself suffers, and abnormal states of the nutrition make their appearance.

A graphic comparison of the average needs of the adult and of the infant in Calories (heat units) of the various food-stuffs is shown in the following table:

| | | | | |
|---|---|---|---|---|
| Proteids, . . . | 110 grms., | 440 Calories; | 15 grms., | 61 Calories. |
| Fat, . . . . | 100 grms., | 940 " | 40 grms., | 372 " |
| Carbohydrates, . . | 400 grms., | 1,670 " | 70 grms., | 287 " |
| | | 3,050 " | | 720 " |
| | | (Average food for adult.) | | (Average food for fully developed infant.) |

Comparison of the above tables shows that the infant requires relatively more fat than the adult, and that the proportion of fat to carbohydrates is far above that of the adult diet. A study of the amount of proteids appears to contradict the statement made above as to the importance of this food-stuff in early life, but if we take into consideration the relatively large amount of food consumed daily by the infant, and also the fact that the proteid of woman's milk is so readily digested, and that, practically, every gram consumed is assimilated and made use of, the apparent discrepancy is explained.

As to the Calorie requirements at the different ages, it has been shown that the infant actually needs one hundred Calories for every kilogram of body-weight, while at ten years this "energy-quotient" falls to sixty Calories pro. kilogram, and in the adult it is approximately forty-three Calories pro. Kg. Accordingly, the infant needs more than twice as much food, proportionately, as the adult. Even in infancy the food requirement gradually falls off. Thus, up to the third month the amount of food consumed under normal conditions equals $\frac{1}{6}$ of the body-weight; from the third to the sixth month it is equivalent to $\frac{1}{7}$ of the body-weight; from the sixth to ninth month it amounts to about $\frac{1}{8}$ to $\frac{1}{9}$ of the same (Heubner).

The food with which nature has endowed the newborn babe for its perfect development is mother's milk, and it is, therefore, a logical conclusion to suppose that a study of the chemical composition of woman's milk will furnish us with a clue whereby the problem of the infant's nutrition may be solved. This certainly is the case, proven not only by numerous experiments in infant feeding and metabolism, but also fully attested to by the empirical facts daily observed. We have learned, therefore, that the only successful results in artificial feeding can come from a close imitation of the natural method. When the child is furnished with the appropriate

amounts of proteids, fat, carbohydrate and inorganic salts in the fresh, natural state, we may expect to have a perfectly balanced metabolism, and as a result a healthy infant. If, on the other hand, we attempt to substitute one form of food-stuff for the other—a common fault of the artificial foods on the market—then we will not only fail to have perfect nutrition but pathologic processes will arise as well. Futhermore, even though the percentages of protein, fat and carbohydrate be theoretically correct, but the mineral salts be deficient or the food be sterilized throughout the entire period of nursing, we will encounter not only disturbances of metabolism but pathologic manifestations as well. The introduction to the subject of artificial feeding must, therefore, be a review of natural feeding, and the hopelessness of attempting to substitute the ordinary class of artificial foods for mother's milk, in which the proteids and fats are usually too low, this defect being compensated for by a relatively high carbohydrate percentage is quite apparent. Children may hold their weight or actually gain weight on such a diet; nevertheless, this gain in fat is accompanied by a waste of the muscle tissue; in other words, the organism may be in carbon balance or retain carbon and at the same time be starving.

### The Composition of Woman's Milk; Breast-Feeding.

Woman's milk is a white, opaque fluid, slightly alkaline in reaction and of a sweetish taste. When allowed to stand until the fat rises to the top it separates into a narrow upper layer, yellowish-white in color—the cream—the lower portion appearing of a translucent, bluish-white color. The chief constituents of milk are its proteids, fat, carbohydrate and mineral salts. There is also a number of other substances, the presence of which is essential to the normal development of the organism. Just what these substances are, and whether they be of the nature of enzymes and antitoxtic bodies, is not definitely known; their absence, however, from a food, or their destruction by means of heat (sterilization) appears to be responsible, in some way, for the development of certain pathological disturbances of nutrition, although we should not be too willing to lay to any single factor the blame for such disturbances, but remember that a number of causes are often active at the same time.

Beside these hypothetical enzyme-like bodies, woman's milk contains also lecithin, a phosphorized fat, which is practically absent in cow's milk. Iron, while present in appreciable quantity, still is not found in sufficient amount to meet the demands of the growing organism, even during the normal period of lactation, and were it not for the excess of iron stored up in the liver from fœtal life, a decided anæmia would develop in every infant toward the end of lactation. The prolongation of the nursing period, however, brings about this anæmia, and the exclusive use of milk as a food for children during the second year results in malnutrition and anæmia (deficient proteids, iron, etc.).

Compared with cow's milk, woman's milk contains a somewhat lower percentage of total solids, the difference in the amount of proteids being the most noteworthy. The percentage of fat in both milks is about the same, but that of carbohydrate (lactose) is higher. Phosphoric acid, like the proteids, is also less in amount. The explanation of this difference, according to Bunge, lies in the fact that the calf grows relatively more rapidly than the human suckling, and a study of the milk of other species of animals, and the rapidity of their early physical development, corroborates the theory that the food upon which growth depends primarily is the proteid and phosphoric acid in the milk supplied to the suckling.

Aside from the lower percentage of proteids, the chief one of which is *casein*, there is a distinct difference in the chemical behavior of the same as compared with the casein of cow's milk. The latter is precipitated in a dense, tough curd on the addition of acetic acid to the milk, while the addition of an acid to woman's milk does not precipitate its casein. Furthermore, it forms a more delicate, flocculent curd in the stomach when the milk is acted upon by the rennin of the gastric juice.

The other important proteid is *lact-albumen*. This is not precipitated by acids, nor is it coagulated by rennin. In cow's milk it is present in the proportion of one of albumen to four of casein; in woman's milk the proportion is one to two. The total percentage of proteids in woman's milk varies between 1 and 2 per cent.; it is not as constant as in cow's milk, which runs fairly uniformly 3½ to 4 per cent.

The fat globules of human milk are smaller than those of cow's milk; aside from this there is no marked difference between the fats of the two.

The reaction of cow's milk is usually acid by the time it reaches the consumer, on account of the development of the lactic acid bacillus. Such a condition is, of course, never present in breast-feeding.

For ordinary clinical purposes, therefore, it may be stated that woman's milk contains on an average 1½ per cent. of proteids, 4 per cent. of fat and 7 per cent. lactose (sugar-of-milk). The following table shows the difference between this natural food and cow's milk, the ordinary substitute food:

| | Woman's Milk. | Cow's Milk. |
|---|---|---|
| | Per Cent. | Per Cent. |
| Proteids, | 1.50 | 3.50 |
| Fat, | 4.00 | 4.00 |
| Carbohydrates, | 7.00 | 4.50 |
| Salts, | .20 | 75 |
| Water, | 87.30 | 87.25 |
| Total, | 100.00 | 100.00 |

### The Factors Influencing the Composition of Breast-Milk.

The milk obtained at the beginning of a milking is known as fore-milk; it is watery and poor in fat. Next comes the middle-milk and lastly the strippings. The middle-milk should be used for an analysis when the entire contents of the breast cannot be obtained. The strippings is especially rich in fat, and this portion contains a higher percentage of fat and proteids than the fore-milk.

The intervals at which the breast is emptied exerts a pronounced effect upon the composition of the milk. The longer the interval, the more watery the milk and the more frequently the child nurses the more concentrated the milk becomes. When the bad habit of putting the child to the breast every time it cries is enforced the child's digestive organs not only become over-worked but the milk also is altered in composition. Such overstimulation of the mammary gland leads to an increased secretion of solids, the milk assuming the character of "strippings."

Food and exercise exert a marked influence upon the composition of the milk. The richness of the milk, that is the amount of *fat*, is increased by a nitrogenous diet; it is decreased by a diet with an excess of fat on account of the diminished metabolism induced by such a diet.

The *proteids* are increased, together with the fat, by a liberal proteid diet; also by insufficient exercise when a liberal diet is enjoyed and, as has been pointed out, by too frequent nursing. One of the chief difficulties frequently encountered with wet-nurses is the change in the character of the milk to an indigestible form from the excess of solids resulting from a too liberal diet in conjunction with too little exercise. These women have been accustomed to a plain fare and plenty of work, as a rule, and the decided change in the character of their mode of life plays havoc with their capability for secreting normal milk.

When the milk is too poor in solids, on the other hand, the diet must be increased in nitrogenous food-stuffs and exercise cut down to a minimum. Often the quantity is normal or even excessive while the quality is poor; this is frequently seen when the mother relies upon the excessive drinking of tea or malt liquors as the source for her milk. If we advise her to drink freely of milk and cocoa instead, the quality of the milk is usually promptly improved. When the *quantity* of milk is below the requirements of the infant's needs the drinking of liquids, even the free use of water, provided a sufficient amount of proteids is taken with the meals, will often increase the flow of the milk. An excellent stimulus to the glandular activity of the breasts is massage. In many instances, however, no plan of treatment will succeed. It is safe to say that if after two weeks of faithful effort to increase the quantity of breast-milk to a sufficient amount to properly nourish the infant we meet with no success, further attempts

are useless, and it becomes necessary to institute either partial or complete weaning.

The effect of alcohol when used in moderation cannot be said to be harmful; in fact, in some instances it is beneficial, the mother's appetite being increased thereby and the necessary amount of liquid supplied in an agreeable form. When used in excess, however, not only the mother but also the child will suffer therefrom.

Menstruation frequently induces changes in the milk, causing it to disagree. On the other hand, in a number of instances the reappearance of the menses is neither accompanied by any changes in the composition of the milk nor by any disturbance in the child's digestion.

Should the mother become pregnant it is not advisable for her to continue nursing, as the drain on the system becomes too great under the circumstances; besides, the milk will deteriorate and there is the added danger of miscarriage.

**The Wet-Nurse.**—Ordinarily the wet-nurse is not desirable, and it is not often possible to obtain a suitable person to fulfil this charge; besides, the expense connected with the employment of a wet-nurse and the inconvenience attending the installation of such a person into the home makes the physician hesitate to recommend one. When, however, the only possible chance of saving an infant's life appears to lie in the use of woman's milk, every attempt at substitute feeding resulting in failure, then the selection of a suitable wet-nurse becomes the physician's duty.

The first requirement which a wet-nurse must fulfil is that she be absolutely healthy. She must be rigidly examined for evidence of tuberculosis, syphilis, etc. Secondly, there must be a sufficient quantity of milk and the breasts and nipples must be in a normal condition. It is also important that the stage of lactation shall correspond closely to the age of the infant to be nursed; for an older infant to suckle from a nurse in the early period of her lactation is a distinct disadvantage. The converse condition is less unfavorable (Baginsky). The prominent influence exerted upon the composition of the milk has been referred to above, and the strictest regulations must be enforced. The care of the bowels is also of prime importance. Highly seasoned food; alcohol; indigestible and "colicky" vegetables; acids, etc. must be forbidden.

### The Analysis of Woman's Milk for Clinical Purposes.

When an infant has difficulty in digesting its mother's milk or does not thrive upon the same, we should proceed to make an analysis of the milk before concluding that the child's digestion is at fault. Should we find the error to lie with the milk, we are in a position to direct our treatment toward the betterment of this secretion. The data necessary for a practical clinical estimation of the fitness of the milk as a food are not complex, nor does it

require intricate chemical tests to determine the same. What we wish to know is as follows :

The quantity (insufficient ; sufficient ; excessive).

The appearance (poor ; rich ; abnormal).

The reaction to litmus.

The specific gravity.

The percentage of fat.

The approximate percentage of proteids.

The microscopic appearance.

These data can be obtained about as readily as the data for an ordinary analysis of urine. The milk is obtained by means of the breast-pump, and we should attempt to get at least an ounce if possible. The color will give a fairly accurate idea as to the richness of the milk. Milk poor in fat and other solids is of a bluish-white color ; when there is an abundance of cream it is of a yellowish color.

The *specific gravity* is obtained by means of the lactometer. A good one for ordinary clinical purposes accompanies Holt's set of apparatus for milk analysis. The specific gravity may range from 1025 to 1035, the average being 1030 to 1031. A low specific gravity indicates a deficiency of solids ; a high specific gravity is due to a high percentage of proteids. Fat tends to lower the specific gravity, but as a high percentage of fat is usually associated with a high proteid percentage, the specific gravity is rarely very low when fat is present in high percentages. Milk running below 1030 is, as a rule, of poor quality ; this is especially the case when there is a deficiency of cream in the specimen.

The estimation of the percentage of *fat* is perhaps the most vital step in the study of a sample of milk. There are a number of methods by which this may be done, but the only method that will be considered here is the calculation of the percentage of fat from the percentage of cream in the specimen. This is done by means of Holt's *cream-gauge*, a tall narrow tube holding 10 cc. of milk and divided into readings of tenths of centimeters. The milk is allowed to stand in the graduate for twenty-four hours ; the percentage of cream is then read and the fat estimated according to the following equation : 5 per cent. cream : 3 per cent. fat :: cream in specimen : x.

The other methods, such as the estimation of the fat by dissolving it out of the milk with ether and then precipitating it with alcohol—Marchand's lactobutyrometer—and the Leffman-Beam method of getting rid of the proteids by means of sulphuric acid after dissolving the fat out with fusel oil and hydrochloric acid and getting a quick reading by the use of the centrifuge—are more accurate than the above simple method but not essentially necessary for clinical purposes.

The *proteids* are not estimated directly, but they are calculated from

the specific gravity and the amount of fat present. We must simply remember that the specific gravity is lowered by fat and elevated by proteids. If, therefore, fat be deficient and the specific gravity low, we must infer that the percentage of proteids is low also. A high specific gravity with normal fat percentage, on the other hand, indicates an excess of proteids.

The microscopical examination should reveal a preponderance of small, uniformly-sized fat globules, indicating thorough emulsification ; they should be present numerously in the microscopic field. After the third week the milk should be free from all cellular elements, of which the colostrum corpuscle is the chief example. These corpuscles are in reality cells from the mammary gland that have undergone fatty degeneration. Pus and blood-corpuscles are also identified by the microscope ; when present the milk is unfit for use.

### Cow's Milk.

There are a few practical facts concerning cow's milk with which the physician should be conversant. In the first place, a quart of milk standing for a period of from five to six hours after milking in a tall bottle (the usual milk bottle) should develop a layer of cream in the neck of the bottle six inches deep. This (gravity) cream contains on an average 16 per cent. fat, but it varies in richness in the different layers, the top ounce containing about 25 per cent. fat, while the last or sixth ounce contains only approximately 5 per cent. fat. (Chapin). In any quart bottle of milk on which the cream has risen the top nine ounces contain about three times as much fat (12 per cent.) as the whole milk contained (4 per cent.), and the top fourteen to fifteen ounces, about twice as much (8 per cent.). This important fact is taken advantage of in the home-modification of milk according to "Chapin's Method," which will be fully described further on. In this method the upper third (ten ounces) from a bottle of set-milk is dipped off with the Chapin dipper to furnish us with a "10 per cent. top-milk," and the upper sixteen ounces to furnish a "7 per cent. top-milk." In other words, the upper ten ounces from a bottle of set-milk when carefully dipped off and then mixed has a composition of 10 per cent. fat and 3½ per cent. proteids ; the upper sixteen ounces, obtained in a similar manner, represents 7 per cent. fat and 3½ per cent. proteids. The first mentioned top-milk is used in the preparation of the infant's food up to the third or fourth month, it simply being necessary to dilute this "stock" with the appropriate amount of sugar-of-milk solution according to the age and digestion of the infant. No matter how we may dilute this top-milk the proportion of fat to proteids will always remain three to one. The 7 per cent. milk is used after the fourth month and similarly diluted. In it the proportion of fat to the proteids is two to one ; this increase in proteids is made to meet the increased demands of the organism for nitrogenous food.

*Impurities.*—Pathogenic bacteria may get into the milk during the pro-

cess of milking in the form of dust or stable filth, or they originate from the water used in cleaning the utensils or for the purpose of adulteration. Among these may be included the putrefactive organisms which induce proteid de composition (proteus vulgaris). The organism which causes the souring of the milk, the bacillus lactis ærogenes, comes from the first few jets from the cow's teats. The observance of absolute cleanliness in milking; the sterilization of the dairy utensils and the rejection of the first jets of milk, in conjunction with the rapid cooling of the milk immediately after milking and protecting it against contamination with dust, will furnish a grade of milk which is practically sterile, and which can be fed without any danger of milk-infection at almost any time of year. Such milk, if continuously kept on ice, may even be fed without sterilization during the hottest months of the year, although it is a good rule to sterilize the food in July and August.

*Preservatives.*—The presence of a preservative, *e.g.*, Formaldehyd, should be suspected in milk which does not turn sour within twenty-four hours when allowed to stand in a warm room.

*Reaction.*—The amount of lactic acid which has formed in the milk by the time it reaches the consumer is a good index of the degree of care with which the same has been handled. The senses of taste and smell are not sufficiently acute to judge of the quality of a specimen of milk, a reliable and practical test being the "Ideal Milk Testers." One of these tablets is dissolved in an ounce of water and the resulting pink solution is added, a teaspoonful at a time, to a teaspoonful of milk until the mixture becomes permanently decolorized. The amount of solution required in the experiment indicates the degree of acidity present.

## The Modification of Cow's Milk.

The above comparative study of woman's milk and cow's milk has taught us that cow's milk in its native state is not a fit substitute for the infant's natural food, and that in order to make the same suitable as an artificial food it must be "modified," that is, it must be so altered in its chemical composition as to conform to the composition of woman's milk as nearly as that is possible under ordinary circumstances. Furthermore, the fact that cow's milk is usually contaminated with micro-organisms must also be taken into consideration, for which reason the advisability of sterilizing the food is to be considered.

It has been pointed out that the main difficulty encountered in feeding an infant with cow's milk is to control the proteids so that they can be digested, for not only does cow's milk contain almost three times as much proteids as woman's milk, but the proteids of the former are of a different character, forming larger and tougher curds under the action of acids and the digestive ferments. For this reason the milk must first of all be diluted before it can be given a babe with any degree of success. As the addition of

water will not only reduce the amount of proteids but also the fat and sugar at the same time, the mere addition of plain water to ordinary milk would furnish us with a food deficient in these important elements. For this reason top-milk (see page 483) or a mixture of milk and cream is used in order to make up for the fat deficit which would otherwise occur, and instead of using plain water we employ a solution of sugar-of-milk of definite strength, by which means the percentage of lactose in the food is controlled. Besides, an alkali, either lime water or bicarbonate of soda, is added when it is desirable or necessary to render the reaction of the food alkaline to litmus. These few facts embody the entire subject of the home-modification of milk, and if they are grasped in their true sense the thought that infant feeding is a complicated and difficult subject will be dispelled.

There is one important fact that must yet be mentioned, namely, that no matter how cautiously we begin with cow's milk, the great majority of babes do not at once take to it kindly, but the human stomach must gradually accustom itself to the same and learn to tolerate this substitute for its natural food. As Chapin expresses it, cow's milk is a physiological insult to the infant's stomach. This explains why we begin with very weak milk mixtures containing what to the uninitiated appears to be ridiculously low percentages of proteids and fat. However, this plan of beginning with low percentages and gradually increasing the same every three to four weeks, relying upon the carbohydrate element in the food as the chief energy producing food-stuff in early infancy, gives the very best clinical results.

The quality of the milk used in infant feeding is of the greatest importance. It is not so much the richness of a given sample that should lead us to look upon it with favor, but rather the care with which the dairy is conducted and the purity of the milk in question. Milk from a mixed herd is preferable to "one cow's milk," as it is less likely to vary in composition from day to day. In the larger cities milk can be obtained that has been handled with especial care and which comes from picked herds. This is sold under the name of "Pediatric, Certified," etc.

Milk laboratories, where milk is modified according to the formula prescribed by the physician, are found in many of our cities, and they are a great help, especially to patients who have not the conveniences for preparing the child's food at home. This method of feeding, however, is not within the reach of those in moderate circumstances. Personally, my experience coincides with that of a number of other pædiatrists, who find that the home-modification of the milk really gives the best results. The Pasteurized Milk Societies which prepare a pure, pasteurized milk already modified according to a number of formulæ suitable for infants at different ages, and also taking into consideration certain digestive disturbances, are carrying out a noble charity. This milk is distributed from various centres in the city (for example, we have a station in the Children's Department of the

Hahnemann Hospital), and is sold for a nominal sum, which is really below the cost of its production. The results obtained with such milk are naturally far superior to the usual results seen from the carelessly modified and impure article fed to the infants of the poor.

**The Method of Modifying Milk.**—As the proper dilution of the milk enters so largely into the process of milk-modifying there must be some definite rule, according to which the amount of water entering into a given formula is to be regulated. It was stated above that one of the first principles of scientific infant feeding is to accustom the digestive organs of the babe to cow's milk by beginning with the very lowest percentages compatible with the immediate needs of nutrition. After tolerance has been once established, we can find the substitute food with a fair degree of safety, but before that time there is great danger of seriously upsetting the digestion. The results of such an upset may not show themselves at once, but the digestive derangement may come on gradually and finally lead to marasmus. The underlying principle of the home-modification of milk can therefore be expressed in the following rule:

For an infant under ten days of age the milk should be diluted 5x; from ten days to four weeks, 4x; from four weeks to eight weeks, 3x; from two months to three months, 2x; after the third month, 1x.

This means, that as many times parts of water as milk are used in the formula as the times of dilution indicates. Thus, in speaking of a five times dilution, we mean that one part of milk and five parts of water enter into the formula. Were we to use ordinary milk in the preparation of such a formula, it will be seen at once, that while the cutting down of the proteids is accomplished by such a dilution, at the same time the fat and sugar is cut down to such a low percentage that the food becomes insufficiently nourishing for the needs of the growing organism. We must, therefore, beside adding water to our formula, also supply an extra amount of fat (cream) and of sugar. This is accomplished either by the use of milk and cream mixtures or by employing the top-milk already referred to. At the same time, instead of diluting with plain water, we employ a solution of sugar-of-milk of definite strength. The reaction of the milk is adjusted by the addition of lime water or bicarbonate of soda to the mixture.

Fig. 8 explains, in a diagrammatic manner, the principle upon which the top-milk method of milk-modification rests. As shown in the diagram, the whole milk contains 4 per cent. fat; when the milk has stood long enough to allow the cream to rise to the top the upper half will naturally contain twice as much fat as the whole milk contained. As, however, the separation of the fat is not absolutely complete, some fat still remaining in the lower strata, this upper half (the upper sixteen ounces dipped from a quart of milk) contains approximately 7 per cent. fat. This is spoken

of as "7 per cent. top-milk." The upper third (upper ten ounces dipped from a quart) should contain about three times as much fat as the whole milk; approximately it contains 10 per cent. fat and is known as "ten per cent. top-milk." In the latter, the relation of fat to proteids is three to one (10 per cent. fat, 3½ per cent. proteids); in the 7 per cent. milk it is two to one. The 10 per cent. milk is used from the time of birth until the third or fourth month, as up to this time the proteids must be kept relatively low in the milk formulæ. When the child has reached the third month, it should have become accustomed to the casein of cow's milk, and, furthermore, the percentage of proteids must now be increased to meet the requirements of the rapidly developing muscular system. For this reason we now employ the 7 per cent. milk, in proper dilution, in place of the 10 per cent. milk, thus raising the proportion of proteids

FIG. 8.—Diagram Showing the Percentage of Fat in Whole Milk and in the Upper Layers of Set-Milk Used in the "Top-Milk Method" of Modifying Milk. (After Holt, from Raue's *Diseases of Children.*)

from one to three to one to two of fat. After the seventh or eighth month, ordinary milk, diluted with a cereal, such as barley or oatmeal water, is to be employed.

The water, which is used as a diluent, should contain sugar-of-milk in the proportion of one ounce of sugar to every twenty ounces of food that is being prepared. In the later period of infancy, granulated sugar may be used instead of milk-sugar. This is employed in the proportion of one to thirty, being much sweeter than milk-sugar. The water, which is to enter into the formula, should be boiled for fifteen minutes; the sugar is then dissolved in the same while it is still hot, and the solution added to the milk after it has partially cooled off. The lime water, in the proportion of one to twenty, is now added, and the mixture should then be poured into the nursing bottles, each bottle being filled with the appropriate amount for a single feeding, the bottles stoppered with sterilized cotton and then

placed on ice. In warm weather the bottles should be placed in the pasteurizer and the milk thoroughly "Pasteurized" before putting them away in the ice-chest. It should be borne in mind that the ordinary refrigerator is usually not sufficiently cold to preserve the milk in perfect condition; the temperature of the same must not be above 50° F. For this reason it is safest to have in the nursery a small refrigerator especially for keeping the babe's food.

The method of obtaining 10 per cent. top-milk is to dip off the upper ten ounces from a quart bottle of set-milk with a Chapin's dipper. This is a long, narrow dipper of one ounce capacity; it is furnished with a long wire handle, by means of which it may be immersed into the neck of the bottle. These dippers may be purchased in most physicians' supply houses.

Seven per cent. top-milk is obtained by dipping off the upper sixteen ounces from a quart of set-milk.

When the top-milk method cannot be carried out, or when the use of cream and milk mixtures is preferred, the following equivalents may be used:

Equal parts of cream and milk equals a 10 per cent. top-milk in composition.

One part cream and three parts milk equals a 7 per cent. top-milk. The cream to be employed in these mixtures should be ordinary gravity cream (the upper six ounces from a quart bottle), which contains 16 per cent. A pasteurized 16 per cent. cream can also be obtained from the better dairies.

In the following table the amount of food for each feeding and for the entire twenty-four hours, and the proper interval for feeding are indicated, together with the proper top-milk and times of dilution, for the different periods of infancy.

| Age. | Dilutions. | No. of Feedings in 24 hours. | Intervals. | Quantity. | Night Feedings. |
|---|---|---|---|---|---|
| Until 1 month ... | 10 per cent. milk, 4x | 10 | 2 hours | 1–2 oz., 10–20 oz. | 2 |
| 1–2 months ..... | 10 " " 3x | 10 | 2 " | 2–3 oz., 20–30 oz. | 2 |
| 2–3 months ..... | 10 " " 2x | 8 | 2½ " | 3–4 oz., 24–32 oz. | 1 |
| 3–6 months ..... | 7 " " 1x | 7 | 3 " | 4–6 oz., 28–42 oz. | 1 |
| 6–9 months ..... | Whole milk, ⅓ diluted | 6 | 3 " | 6–8 oz., 48 oz. | 0 |

The composition of any of the above formulæ is readily calculated by simple division. For example, if we wish to know the percentages of fat and proteids in the second formula, in which the 10 per cent. top-milk is diluted three times, we simply divide the 10 per cent. of fat and 3½ per cent. of proteids by four, as the milk represents one-fourth of the mixture, the other three-fourths being water, and the result is 2½ per cent. fat, ⅞ per cent. proteids. In the third formula the percentages are 3⅓ per cent. fat, 1⅙ per cent. proteids, the ratio of fat to proteids always remain-

ing 3:1. In the fourth formula the percentages are one-half that of the composition of 7 per cent. top-milk, namely, fat, 3½ per cent., proteids, 1¾ per cent. In this the ratio of fat to proteids is two to one.

The following table gives a series of *milk and cream mixtures* covering very satisfactorily the requirements of the average infant at different ages:

| | No. 1. | No. 2. | No. 3. | No. 4. | No. 5. |
|---|---|---|---|---|---|
| Milk, | 1½ oz. | 2 | 4 | 12 | 18 |
| Cream. | 1½ oz. | 2 | 4 | 5 | 6 |
| Lime water, | 1½ oz. | 1½ | 1½ | 2 | 2 |
| Water, | 15½ oz. | 14½ | 22½ | 23 | 22 |
| Milk-sugar, level tablespoonful, | 2½ | 2½ | 4 | 5½ | 6½ |
| | 20 oz. (3 to 14 days.) | 20 oz. (2 to 6 weeks.) | 32 oz. (6 to 12 weeks.) | 42 oz. (3 to 5 mos.) | 48 oz. (5 to 8 mos.) |

These formulæ represent a gradually increasing strength in the composition of the food so graded as to conform with the requirements of nutrition as well as to slowly accustom the infant's digestive tract to cow's milk. A comparison of this table with that in which top-milk has been recommended, will show that the amount of cream and milk in each formula corresponds with the amount of top-milk in said formulæ. There is, therefore, no essential difference in the two tables.

These formulæ cannot be expected to suit each individual case, but they are to be looked upon merely as standards by which the physician may be guided in the selection of the proper food for a given case.

My personal experience with the top-milk dilutions above described, although bearing the stamp of approval of such eminent authorities as Holt and Chapin, has not been entirely satisfactory in all cases. I have at times found that the formulæ recommended by others are too weak for a great many cases, and that frequently trouble was caused by the relatively high fat percentages which they contain. In such cases, as soon as plain milk was used the infant began to gain and the digestion improve.

When fat indigestion has been induced it may become necessary to resort to the use of skimmed milk for a time. There is still a widespread misapprehension in regard to the digestibility of casein, and the fact that fat may produce equally as much trouble in infant feeding as proteids is not generally recognized. For a detailed discussion of this subject the reader is referred to a paper by the writer in the *Hahnemannian Monthly*, November, 1907.

The following conditions and symptoms must be carefully noted, and according to the indications based upon such observation, the amount of food and the percentage of fat, proteids and sugar may be regulated.

If the child vomits shortly after finishing its bottle it is either getting the food too rapidly or in too large quantities.

Regurgitation of food between feedings, either sour or rancid, indi-

cates an excess of fat. Persistent vomiting is frequently a sign of fat indigestion.

Vomiting of large curds, half an hour or more after feeding, is an indication either of too much proteids or proteid indigestion.

Constipation, as a rule, is an indication of deficient fat or of a general deficiency of solids in the food. Excessive fat feeding produces constipation with large, grayish stools.

Curds in the stool, when the latter are green and inclined to be loose, are usually a sign of too much proteids or proteid indigestion. Barley water should be substituted for plain water, and if this does not correct the condition the milk must be still further diluted. Ordinarily, the curds found in the infant's stool are fatty soaps and other fat products.

Colic is either a sign of proteid indigestion or results from too rapid or too frequent nursing. When due to fermentation it may be the result of excess of sugar in the food.

As to the quantity and strength of the food, a large, robust child naturally requires more food than a delicate, undersized child, and vice versa. Constant crying between feedings, when not due to pain, signifies hunger ; this, together with insufficient weekly gain in weight, suggests an increased quantity or less dilution of the food.

The percentage of proteids and of fat in the food can easily be regulated when indications for a change in the same are present. For example, if the proteids are causing the trouble, a further dilution of the food is called for. In a child that is digesting the fat well there is no necessity for decreasing the fat in the formula at the same time, and the reduction in the proteids can therefore be accomplished by using a top-milk of higher fat content. If the child be above four months old and shows signs of proteid indigestion we should return to the 10 per cent. top-milk and dilute it with one and one-half parts water ; this will give us about the same amount of fat as if we were using a 7 per cent. top-milk once diluted, but the proteids will be considerably lower. In the case of younger infants, in whom there is difficulty in digesting proteids, but who are able to digest and assimilate the normal amount of fat, we may use the upper nine or even eight ounces and then dilute with more water. This will have the effect of cutting down the proteids, while at the same time the fat percentage is not affected. It is rare, however, that such a procedure becomes necessary. On the other hand, when fat disagrees, we must resort to the use of a top-milk of a lower fat percentage ; sometimes it is even necessary to use ordinary milk, properly diluted, before it will agree with the infant, and in some exceptional cases skimmed milk may be used.* This same intolerance for proteids may also be encountered and then the casein must be gotten rid of ; this is achieved by using whey.

* See *Hahnemannian Monthly*, November, 1907.

### The Intervals for Feeding and the Quantity Required by the Child at Different Ages.

The newborn infant is put to the breast as soon as the condition of the mother will permit. Milk is not secreted before the third day, but colostrum is present to act as a temporary food and to initiate the digestive tract into its new duties. Colostrum is a fluid rich in proteid and fat; the proteid, however, is not of the character of casein, for it does not coagulate after reaching the stomach like the latter. The fat consists largely of cells from the acini of the mammary gland undergoing fatty metamorphosis. Colostrum no doubt also acts as a laxative, and thus aids the intestinal tract to rid itself of the meconium.

During the first two days the babe may be put to the breast every four hours. When artificial feeding must be instituted from the very beginning an ounce of a 5 per cent. solution of sugar-of-milk may be given in this manner.

From the third day until the end of the sixth week the feedings should come every two hours during the day and every four hours during the night; this will make ten feedings in twenty-four hours. This holds good for breast or bottle feeding alike.

From the sixth week to the third month the feedings are lengthened out to two and one-half hours, making eight feedings in the twenty-four hours.

After the third month the feedings should come every three hours and the night feeding abolished; this cuts the feedings down to six in twenty-four hours.

The quantity of food must naturally be increased with the growth of the child. At birth the infant's stomach holds approximately one ounce; its capacity increases at about the rate of one ounce every month. The average quantity of food required for a single feeding and for the entire twenty-four hours is given in the table on page 484.

### Sterilization of the Food; Pasteurizing.

While cow's milk is practically never sterile, still the bacteria found in a clean specimen of milk coming from healthy cows and which has been sent out by a carefully conducted dairy are not injurious to the infant's health. The organism normally present in milk is the bacillus lactis ærogenes, and it acts as a ferment upon the lactose, converting it into lactic acid (souring of milk). When this bacillus is present in abnormally large numbers, however, the milk will disagree, producing acute indigestion. If the milk has become contaminated by other bacteria, such as the proteus vulgaris, which is the ordinary filth germ, more serious disturbances will

result. Not infrequently pathogenic bacteria find their way into milk, and under these conditions serious disease will result if the milk be used as a food. The diseases that have been directly conveyed by milk are notably tuberculosis, scarlet fever, typhoid fever, diphtheria, foot and mouth disease, and the acute gastro-intestinal inflammations traceable to unclassified bacterial infections and to the dysentery group of bacilli.

A good pure milk can be fed with impunity in the vast majority of instances in cold weather, but during the hot months of the year the greatest care in the handling and keeping of the milk will not always prevent bacterial contamination. For this reason, even the best milk should be sterilized during the summer months, while a questionable brand should be invariably sterilized.

It is still a disputed question whether the long-continued use of a sterilized food will result in disaster to the child's health, and there is no doubt that scurvy has been observed to follow frequently upon the exclusive use of a food thus prepared. Lesser forms of malnutrition are still more frequently seen when sterilized milk is persistently used. These conditions, however, do not arise suddenly, but it requires time for their development. An acute milk-infection, however, is a most serious matter, and its development can never he foretold. For this reason, it appears to be the most logical course to sterilize the food during the summer months, and if a pure reliable milk can be obtained it may be fed raw during the cool months of the year.

Absolute sterilization of the food is not essential. The process of **Pasteurizing** accomplishes all that is necessary as far as the destruction of the bacteria in the milk is concerned without producing the chemical changes resulting from boiling or sterilizing.

Pasteurizing is best accomplished by means of a Pasteurizer, such as Freeman's apparatus. A home-made substitute can be constructed as follows: A large tin pail holding six quarts should be fitted with a false bottom having several perforations made through it. The purpose of the false bottom is to prevent the bottles from coming into immediate contact with the bottom of the pail, otherwise they would become heated more than it is desirable they should. The bottles having been filled with the proper amount of feeding mixture are stoppered with sterilized cotton and placed in the pail, which is filled with water up to the level of the milk in the bottles. The water is now rapidly heated and brought almost to the boiling point; the pail is then taken from the fire, covered with a heavy cloth to prevent too rapid cooling of the water, and at the end of half an hour the bottles are taken from the pail, rapidly cooled, and put on ice.

By this process the milk has been heated to about 75° C. or 167° F. for almost half an hour, which is sufficient for the destruction of the ordinary disease-producing organisms. Such milk will also keep better than raw milk, as the lactic acid bacillus is destroyed by the process.

### Other Foods than Milk; Weaning.

During the first year there may be added to the child's dietary farinaceous food in the form of thin gruels prepared from barley, oatmeal, rice, potato or wheat flour, used as diluents for the milk. In the first four months of infancy all farinaceous food should be given in a dextrinized form, as salivary and pancreatic digestion are very feeble in the young infant; even after this time starch should not be relied upon much as a food until the infant has its molar teeth and begins to masticate its food. In early infancy barley water is chiefly employed to render the curds of the cow's milk more digestible; it is the best diluent to use in the modification of milk when proteid digestion is at fault. It is also the most important substitute for milk to be employed in conditions of acute indigestion and diarrhœa, when milk must be withdrawn temporarily from the infant's diet. (See treatment of Infantile Diarrhœa.) Under these conditions it is not necessary to dextrinize the barley water; in fact, I believe better results are obtained from the use of a weak solution of barley flour in its natural state when we are using it simply for its demulcent and curd-splitting properties. When used as a food, however, it should be dextrinized by the addition of some diastatic ferment, such as Cereo, Forbes Diastase or Maltine.

By the end of the first year the farinaceous preparations are used more for their actual food value, and we then add them to the milk in the form of thick gruels in the proportion of one to two ounces to the bottle.

Beef juice is a valuable food for infants who are anæmic or who do not thrive well on milk alone, especially when we are obliged to feed low percentages of proteids. It is also a valuable adjuvant in the treatment of scurvy. A teaspoonful may be given two to three times daily in the latter part of the first year; earlier, half that amount is sufficient, excepting in the case of scurvy.

Orange juice possesses decided anti-scorbutic properties, besides being valuable in constipation. It should be given regularly to infants taking sterilized and proprietary foods. The dose is the same as recommended for beef juice.

**Weaning.**—Weaning should be begun at the end of the ninth month, providing there are no indications for instituting it earlier. If the time for weaning occurs during midsummer, it is advisable to carry the infant along, if possible, until the extremely hot weather is over; by doing this we are less likely to have the infant attacked with summer-complaint than if artificial feeding must be relied upon at this time of year. If the mother's milk has become deficient in quantity before the ninth month, or if it is insufficiently nourishing for the child, as indicated by hunger, fretfulness, failure to gain, weaning must be begun earlier. It is impossible to set the

time for weaning arbitrarily; the ninth month is about the average time under the best of conditions, but it is rare to find women in the cities who are able to nurse their babes successfully up to that time.

Weaning is usually begun gradually. For the first few days a bottle of modified milk is substituted for a nursing; as the child becomes accustomed to the bottle, another is added until the breast is eventually dispensed with entirely. It may be said, more or less arbitrarily, that a child just weaned from the breast is not able to digest a formula of cow's milk of the strength which a child that has been reared on cow's milk is able to digest. We must, therefore, begin with a somewhat weaker mixture than one suitable for a babe that has been raised by the bottle. By the fifteenth month the child should be weaned from the bottle and taught to drink from a cup. The 10 P.M. feeding, however, may be given in bed from a bottle.

**Diet During the Second Year.**—During the first half of the second year five meals a day are given at intervals of four hours, the fifth meal being a bottle at 10 P.M. Ten ounces of milk containing a cereal (eight ounces milk, two ounces barley or oatmeal gruel) will furnish the main article of diet; this may be given four times daily. At the noon meal a coddled egg or some rare, scraped meat, given on alternate days, may be added to the dietary. Stale bread and zweibach, softened with milk, are allowable; also fruit juices, the soft portion of a baked apple and the pulp of prunes. By the end of the second year, after the teeth have made their appearance, a child should be able to take table food of a light, digestible character. Meat, however, should only be allowed sparingly, and tea and coffee prohibited. The drinking of water between meals should be encouraged.

The following **Dietary** is appended to serve as a guide to rational feeding in later infancy:

**Diet from nine to twelve months:**

Whole milk six ounces, barley water three ounces, granulated sugar one drachm; a bottle every three and one-half to four hours (five feedings in twenty-four hours). Orange juice and beef juice should also be given as above directed.

**Diet from twelve to sixteen months:**

Whole milk eight ounces, barley or oatmeal gruel two ounces, sugar one and one-half drachms; feed every four hours (five feedings in twenty-four hours).

If the child is progressing normally we must gradually accustom it to solid food at this period. This is best accomplished by substituting for the noon bottle a meal something like the following: A coddled egg or a tablespoonful of finely minced or scraped rare meat; a small cup of broth, with bits of stale bread broken into the same. A little of baked potato, with beef juice poured over it, may also be added gradually. Orange juice

may be given between meals as during the earlier periods, although stewed fruit may now be added to the dinner with advantage.

Diet from the sixteenth to the twenty-fourth months :

7 A.M., a tablespoonful of orange juice and a drink of water.

7.30 A.M., a cereal ; a soft-boiled egg, not necessarily every day ; eight ounces of plain milk ; bread and butter.

11 A.M., cup of broth with rice or barley. (If broth is to be given for dinner, this meal should be a glass of milk.)

2 P.M., finely minced meat, every other day ; a cup of broth or milk ; baked potato, or boiled rice, macaroni, a well-cooked fresh vegetable ; bread and butter ; dessert (milk puddings, junket, custard, gelatin, stewed fruit).

6 P.M., a cereal or bread and milk or milk toast ; stewed fruit.

During the **third year** the same schedule is observed, but the variety and quantity of food is gradually increased. Great care must, however, be observed during the entire period of childhood, and indigestible articles of food and the use of sweets and eating between meals must be rigidly avoided.

## The Preparation of Foods Other Than Milk; Proprietary Foods.

The indications for the use of barley water and beef juice have already been considered. Beside these, there are a number of other preparations which are of inestimable value, both as foods in health and as adjuvants to the dietary in sickness. The formulæ for the preparation of these foods and their special indications will be taken up seriatim.

*Barley Water.*—Barley water is one of the best foods to use when milk must be temporarily withdrawn from the dietary, as in acute diarrhœas. As a diluent for the milk it is especially valuable after the third month, both adding to the food-value of the mixture, and at the same time rendering the curd of the casein more digestible. In feeding young infants a farinaceous preparation, when the same is given as a food and not merely as a temporary substitute for milk, it should be dextrinized by the addition of a diastatic ferment.

The most satisfactory method of preparing barley water is from barley flour (Robinson's Barley Flour). The ordinary strength is made by mixing a rounded tablespoonful of the flour with a little cold water, then adding one quart of water and boiling for fifteen minutes ; keep the quantity up to one quart. To make it from the grain we take two ounces of washed pearl barley and boil in a covered vessel for twenty minutes with a pint and one-half of water ; boil down to one pint.

To make *barley jelly* take one ounce of barley grains, soak in cold water over night ; boil with a quart of water in a double boiler down to

one pint. This will take several hours. A pinch of salt should always be added to these preparations.

*Rice Water.*—Rice water is a very nutritious, soothing drink and may be used in place of barley water. It is made as follows: Soak one ounce of washed rice grains in a quart of warm water for several hours. Then boil slowly in a double boiler for an hour, keeping the quantity up to one quart and strain. Add salt.

*Oatmeal Water.*—This is used as a diluent of the milk when the child is constipated and when it is necessary to supply more mineral salts to the dietary. Oatmeal water may be prepared from the flour in the same manner as barley water.

*Baked Flour.*—By the process of baking the starch granules are burst and some of the starch is converted into dextrin, making the flour more digestible. A water cracker is a good example of baked flour, but it contains besides a small amount of lard. This is not objectionable under ordinary conditions. If such a cracker be rolled into a fine powder, stirred into a paste with water and then boiled with sufficient water to make a thin pap, milk being added after the flour has boiled with the water for fifteen minutes and the mixture allowed to come once more to the boiling point, we have an economical as well as digestible and highly nourishing food. I have used this receipe with pronounced success as a food for delicate and marantic infants past six months old; infants over a year old may take this food in the same manner as a cereal. If it be sweetened by the addition of a malt preparation it becomes more digestible and mildly laxative.

*Albumen Water.*—This is a nutritious, soothing drink often retained when the stomach rebels against apparently everything put into it. It is made by lightly beating the white of one egg with a fork, just sufficiently to break up the integrity of the albumen so that it will dissolve readily and then adding six ounces of cold water, a pinch of salt and a level teaspoonful of sugar. A drachm of brandy may also be added.

*Beef Juice.*—Beef juice, prepared in the proper manner, is a highly nutritious, albuminous food, rich in iron and potash salts. It can be so prepared that it is practically a raw food. For these reasons it is of such great value in the treatment of malnutrition, anæmia, rickets, and scurvy. It is also a valuable proteid to be used as a substitute for casein when the latter is not well digested. When the likelihood arises that the child will have to take beef juice for some length of time, it is economy to buy a meat-press.

A piece of sirloin steak from which the fat has been removed is rapidly broiled in a hot pan, just sufficiently to make the juice run out of it, and then put into the press and the juice extracted. Young infants should receive one to two drachms daily diluted in water or mixed with the feedings. With older children a good plan is to pour the juice over some baked potato, or saturate a piece of toast with the same.

*Whey.*—Whey represents the soluble, non-coagulable proteid of the milk, and also contains the milk, sugar and salts. It is therefore a valuable food to be used in cases of proteid indigestion. Cream may be added to bring up the fat percentage. It is best prepared with a good essence of pepsin, such as Fairchild's.

*Fruit Juices.*—The usefulness of fruit juices both as a prophylactic and curative agent against scurvy has been referred to. Orange juice is most frequently used.

**Proprietary Foods.**—Proprietary foods may be divided into two classes, namely, those claiming to substitute mother's milk completely and those simply offered as modifiers of cow's milk. The results of using the first class are usually pernicious; not only do they fail to supply the requirements for normal metabolism, but their use leads to the development of rickets and scurvy. Their faults may be summed up as staleness, insufficient fat and proteids, excess of carbohydrate.

A more normal balance of the food-stuffs is attained by the use of the simple milk modifiers, but there is no advantage in their use, and the formulæ usually recommended in the circulars accompanying these foods are not based on the accepted principles of scientific infant feeding. Another fault is that it is usually recommended that the milk be brought to the boiling point in the preparation of these foods; I have seen a number of cases of scurvy result from the long-continued carrying out of this practice. Furthermore, the expense connected with the use of proprietary foods must be taken into consideration, in contrast with the economy and the advantage of using freshly-prepared modifiers, such as barley water, rice water, sugar-of-milk or malt solutions, as the occasion may require. Anyone who will take the trouble to acquaint himself with the principles of infant feeding, and who will recommend the simpler home-modification methods will soon learn the superiority of such feeding over patented foods. And lastly, the ethical view-point must not be overlooked. The majority of proprietary foods are advertised either directly or indirectly to the public. The literature accompanying the packages of food sets down arbitrary rules which it is intended that the mother or nurse follow at her own discretion to suit the particular baby she is caring for. Unfortunately, the attending physician is too frequently indifferent enough to acquiesce, and thus allows the manufacturing chemist to act as pædiatrist in the case.

# CHAPTER XII.

## DISEASES OF THE LIVER.

The presentation of a proper outline of the methods of treatment required in cases of disease of the liver is a task of considerable difficulty, made so mainly by the fact that disturbances of this organ are very exceptionally only not associated with pathological changes elsewhere. Thus, fatty and amyloid liver are local expressions of widespread organic changes; passive congestion is one of the phenomena of ruptured cardiac compensation or of pulmonary emphysema; active hyperæmia is practically always associated with gastro-intestinal disease; and even such a distinct clinical entity as cirrhosis seldom exists without other changes induced by alcohol, or by lesions originating in a high grade of portal stasis. Hence it is that my remarks on the treatment of hepatic derangements are fragmentary to a degree that is disappointing to me as it must be to my readers.

### Active Congestion of the Liver.

The prophylactic treatment of active hyperæmia of the liver demands a consideration of the causes producing this condition. In the first place, the so-called "taking cold" plays a part in certain cases, almost exclusively, however, in individuals who live or have lived in tropical climates, and have been the victims of malaria or dysentery. Even then, the exposure to cold is not likely to vent its ill-effects on the liver unless the patient is addicted to heavy eating, and more or less immoderate indulgence in alcoholic beverages.

The majority of cases of active hyperæmia of the liver originate in poisons formed in the gastro-intestinal tract, and which are carried to the liver by the portal vein. To a certain extent congestion from this source is physiological, as it always occurs during the active periods of digestion; but when indigestion exists, or the subject is in the habit of indulging too heavily in spices and condiments generally or in alcoholic beverages, or eats to excess, the bounds of the physiological are often passed, and the hyperæmia becomes a pathological condition.

Constitutional diseases favor active hepatic congestion. Thus, the acute infections, especially typhoid fever, malaria, and dysentery, and gout, diabetes, and habitual constipation, act as predisposing factors to make the dietetic and hygienic transgressions more active.

With the above presentation of the causes of active congestion of the

liver, we are prepared to formulate instructions as to its prevention. Individuals predisposed to it by dysentery, malaria, etc., should avoid exposure to cold, which may best be accomplished, as suggested by Lauder Brunton, by the simple expedient of wearing a flannel binder over the upper portion of the abdomen. This may be reinforced by an extra thickness over the right hypochondrium.

As to diet, the most important injunctions relate to the restriction of the quantity of food between attacks, and abstinence from alcohol at all times.

As constipation exerts an unquestionably bad influence on the liver, it is of the highest importance that the patient has a normal bowel movement each day. For the measures to be employed to this end, the reader is referred to the chapter on the treatment of "Constipation."

With the advent of an attack, the patient's interests will be best served if he is ordered to bed for a few days, If the attack is a severe one, there must be no compromise ; not that life is endangered by negligence of rest, but recovery will be more prompt and complete, and directions will be better carried out if the patient is taken from daily temptations and business cares and worries.

The best diet is milk, which should be administered in moderate quantities and at regular intervals, as in typhoid fever. Patients frequently object to milk on the plea that it makes them "bilious," by which they generally mean that constipation ensues. Semmola has demonstrated, by means of his extensive experience, that milk is unquestionably the food which throws a minimum of labor on the liver. Hence it is that he is enthusiastic in advising it as a routine diet not only in active hyperæmia, but in other diseases of that organ. If ordinary milk cannot be tolerated, we may give it in modified form, as junket, peptonized milk, skimmed milk, buttermilk, or whey. If the patient has been previously well-fed, it is generally advisable to limit the amount of nourishment to a minimum.

When milk is positively not tolerated in any form, chicken or mutton broth may be substituted.

Attention to the bowels is always of importance. Usually, a full enema of salt water or of water and glycerin—water, 24 oz., and glycerin, 8 oz.—will be efficient. Should it fail, one-fifth grain doses of Calomel every hour until one grain of the drug has been taken, followed by half a bottle of Citrate of magnesia, will give a satisfactory result. Free purgation, as advised by many authors, is rarely, if ever, necessary.

For the relief of the hepatic pain, hot applications, as the hot-water bottle, hot poultices of flaxseed, antiphlogistin, etc., are the best. Some authorities have recommended that the congestion be reduced by local depletion, as by the application of leeches to the hypochondrium or anus. The evidence at our disposal would indicate that such a measure is of

doubtful utility, for it is highly improbable that the hepatic congestion is reduced thereby. Besides this, the remedy does not reach the origin of the disease. The advice that in extreme cases the liver be punctured is not to be considered seriously. It is certainly of problematic utility, and the dangerous consequences of puncturing an important bloodvessel and producing serious hæmorrhage are not to be minimized.

The remedies which will prove curative in active congestion of the liver are mainly those indicated in acute gastro-intestinal disturbances, notably *Nux vomica*, *Bryonia*, and *Mercurius*. *Belladonna* is occasionally useful, being indicated by the severity of the pain and the local tenderness. *Bryonia* is also adapted to the painful cases, though here the pain originates in the peritoneal covering of the liver, and is aggravated by respiration. *Nux vomica* is probably the routine remedy of the majority of practitioners, being indicated by the symptoms and the causes at work in the majority of cases.

*Vipera* is recommended by Jousset when the gastro-intestinal symptoms have subsided. The same authority recommends *Leptandra* when there are deep burning pain in the hepatic region, frontal headache, and jaundice.

Other medicines to be considered include *Cinchona*, *Sulphur*, *Lachesis*, *Iris versicolor*, *Ammonium muriaticum*, *Sepia*, *Euonymin*, *Podophyllum*, *Chamomilla*, *Hepar* and *Lycopodium*.

## Passive Congestion of the Liver.

(***Cyanotic liver; nutmeg liver; cardiac liver; chronic venous engorgement of the liver.***)

When the liver is passively congested because of the pressure exerted upon important venous trunks by aneurysms and intrathoracic growths, or when hepatic carcinoma produces local passive engorgement, practically nothing can be expected from treatment, aside from the adoption of measures directed to the alleviation of symptoms. When, on the other hand, the lesion is dependent upon failure of cardiac compensation, the results of treatment are often little short of the marvelous. Benefit may also accrue from treatment in cases originating in chronic pulmonary disease, as chronic bronchitis, emphysema, pulmonary fibrosis, and pneumokoniosis.

Practically, the treatment of passive congestion of the liver consists in restoring the strength of a disabled heart, for even in the cases originating in respiratory disorders, the venous engorgement is dependent upon a dilated heart. Hence it is that the physician should follow out the plan of treatment elsewhere outlined for the care of ruptured cardiac compensation. In the majority of cases, *Digitalis* will be found to be the most efficient drug. Quite frequently it fails to act satisfactorily before the hepatic engorgement is relieved in part by free purgation by the administration of a saline purge or Calomel.

When ascites is at all prominent, it is wise to perform paracentesis abdominis, as the remedies act better after intra-abdominal pressure is relieved in this way.

*Calomel* is unquestionably the most satisfactory diuretic when passive congestion of the liver is accompanied by dropsy. It should be given in doses of two or three grains three times daily. As stated elsewhere, there need be no fear of the excessive purgation to which it may give rise occasionally. This subsides in a few days. More important is the attention to the mouth, lest a mercurial stomatitis be produced. With the first sign of this condition the drug should be discontinued.

Other cardiac tonics than Digitalis may be employed successfully, when that remedy fails, or for some reason is manifestly unsuitable.

In the pulmonary cases, considerable relief is ofttimes afforded by the administration of *Ammonium carbonate* in doses of five grains every two hours. This drug should always be freely diluted with water before administration.

For the relief of pain, hot applications usually prove satisfactory.

The recommendations given in many text-books that patients with passive congestion of the liver take treatment at some health resort or water cure does not strike me as rational. The primary lesion in the heart indicates most unquestionably that the patient should be at rest, and that we know can always be best secured at home.

## Acute Yellow Atrophy of the Liver.

(***Icterus gravis; ictere typhoide.***)

The results of the treatment of acute yellow atrophy of the liver have been so uniformly fatal, that it seems a work of superogation to outline its therapeutics. Cases of this disease, it is true, have been reported as having made recoveries, but they were taken in their early stage, and their diagnosis is by no means beyond suspicion.

It has been suggested by Hoppe-Seyler and Quincke that something may be done in the way of prophylaxis when jaundice and intestinal mycosis occur in women, and especially in pregnant women. Acute yellow atrophy is so rare, however, that we cannot assert that prophylactic measures have accomplished anything more than the cure of the case in hand. Undoubtedly, the patient should be sent to bed with the appearance of the first symptoms, and a rigorous milk diet instituted, as being the most likely to favor a comparative intestinal asepsis. This latter condition can be still further assured by securing daily evacuation of the bowels, and especially by an early and free purgation with Calomel.

The use of the so-called intestinal antiseptics, as Salol, Naphthalin, etc., are of very doubtful utility. It seems to have been conclusively demonstrated that no drugs are capable of producing intestinal antisepsis.

Of homœopathic remedies, *Phosphorus* is unquestionably well indicated, and yet it has failed in the few cases in which there have been opportunities of trying it. Still, the same may be said of all other drugs. The mental, gastric, and cutaneous symptoms of Phosphorus coincide so closely with those of the disease under consideration, that it is at times difficult to make a differentiation aside from the history of the case. Other remedies which may be considered as of possible utility are *Arsenicum*, *Belladonna*, *Hyoscyamus*, *Hamamelis*, and *Cinchona*.

Hypodermoclysis or venous infusion of normal salt solution may prove useful in combating the toxæmia, and should be given a thorough trial.

Jousset recommends *Aconite* and *Lachesis* in addition to *Phosphorus*.

Vomiting, which is often a troublesome feature, must be treated symptomatically.

Collapse is best treated by stimulants.

## Acute Perihepatitis.

As is the case with inflammations of the serous membranes generally, perihepatitis is seldom a primary affection, especially in temperate climates. It is always necessary that we conduct our treatment with full regard to the causative lesion or lesions. When, as occasionally is the case, the inflammation is dependent upon fracture of ribs, the treatment is essentially surgical. Generally, however, the lesion is part of a general peritonitis due to appendicitis, ulceration and perforation of the hollow viscera, pancreatitis, cholecystitis, etc., in which case the physician should rely upon the judgment of an experienced surgeon for therapeutic suggestions. In the majority of such instances the pathological changes are so far advanced that curative treatment is of no avail.

Perihepatitis, accompanying croupous pneumonia, pleurisy and pericarditis, should be treated medically according to the principles involved in the management of inflammation of other serous membranes.

Absolute rest in bed is necessary in all cases. The diet should consist of liquid foods only. The inflammation may, in a measure, be controlled by the application of ice-bags or of hot-water bottles or poultices to the right hypochondrium. In the majority of cases the hot applications are the better, especially when they are successful in relieving the local pain. Should the latter symptom persist the best analgesic is Morphia, which may be given in doses of from one-eighth to one-quarter of a grain as often as every four hours. The associated constipation is best combated by the daily use of enemata.

Counter-irritation by means of the actual cautery or fly-blisters is favored by some authorities, but are of doubtful utility. They are open to the serious objections of complicating the state of affairs should the case subsequently prove to come within the domain of the surgeon.

In the early stage of the disease the most efficient remedies are *Aconite*, *Belladonna*, *Bryonia* and *Baptisia*. *Aconite* is seldom indicated after the local manifestations become prominent. At the most, it is useful when there are high fever, restlessness, and stitching pains in the right hypochondrium.

*Bryonia* is adapted both symptomatically and pathologically to the majority of the cases having no septic complications, and should always be selected when there are no special indications calling for other remedies. It is especially indicated when there are sharp stitches in the right hypochondrium, greatly aggravated by respiration and general movements of the body, yellow-coated tongue, bitter taste in the mouth, constipation with hard, dry stools and fulness and bloating of the abdomen.

*Asclepias tuberosa* is used by eclectic physicians in pretty much the same line of cases in which we prescribe Bryonia. Goodno recommends this remedy as suitable to cases in which the one usually recommended fails.

*Belladonna* is indicated in cases in which the primary condition is one of inflammation of the liver itself. Fever is high, but as yet has not assumed the features characteristic of suppuration. The local pain is severe, and is associated with considerable tenderness and throbbing. Headache is generally present, and is attended by throbbing, red face, more or less delirium, and sleeplessness.

*Baptisia* is suggested by the supervention of typhoid or septic symptoms.

When the acute symptoms have subsided, but local manifestations still linger, *Sulphur* may prove useful as under similar conditions of serous membrane inflammations.

Other remedies to be considered include *Chelidonium*, *Rhus tox.*, and *Mercurius*.

**Chronic perihepatitis** usually requires *Potassium iodide*, *Mercurius*, or *Aurum muriaticum*.

## Acute Suppurative Perihepatitis.

(***Subdiaphragmatic abscess.***)

Suppurative perihepatitis calls for the general treatment demanded in suppurative conditions generally, the internal administration of such remedies as *Hepar*, *Mercurius*, *Silicea*, *Arsenicum iod.*, and *Sulphur*, and early evacuation of the pus by surgical intervention. As soon as the diagnosis is assured, no time should be lost in instituting radical treatment. As the character of the operation varies according to the situation of the lesion, the general practitioner should evade all responsibility by turning the case over to an experienced surgeon. In some cases, a simple incision below the costal arch is all-sufficient. In others, however, it may prove necessary to

resect ribs, or even to get at the collection of pus by way of the pleura. Even after thorough drainage of the abscess is accomplished, many questions involving nice judgment for their solution are liable to arise.

## Acute Hepatitis.

The actual existence of an acute hepatitis of non-suppurative character may be regarded as debatable, as many eminent authorities deny its existence. Still others admit an acute hepatitis, but provide for so many varieties, all of which are secondary to other conditions, that we are not aided by them in establishing hepatitis as a separate clinical entity. Of these, we have already considered acute atrophy of the liver, which has been called a diffuse parenchymatous hepatitis. Again, we have the focal necroses complicating typhoid fever, scarlatina, diphtheria, and numerous other infections. Nothing need be said of the treatment of these, because they are not amenable to special therapeutic measures, the patient receiving the treatment directed to the primary infection. Rolleston regards these focal necroses as a patchy manifestation of a "process which when diffused gives rise to acute yellow atrophy."

Still there remains a condition of hepatitis which may be regarded as an advanced type of active hyperæmia. It is not infrequent after malaria and dysentery, and is observed especially in tropical countries. Acute hepatitis is also a possibility apart from malaria and dysentery in tropical countries among Europeans, whose habits and methods of eating have not been adapted to climatic conditions.

The symptoms of acute hepatitis are such that there is no difficulty in enforcing the necessary rest in bed. The diet must be liquid and non-stimulating. All alcoholic beverages should be positively forbidden. Milk and gruels should constitute the staple foods. The local treatment should be that already advised in the treatment of active congestion.

The malarial cases generally do well on *Quinine* or *Arsenic*. *Belladonna* and *Bryonia* should be prescribed in the frankly inflammatory cases.

Cayley has advised the prescription of *Ammonium chloride* in 60 to 90 grains daily.

It is important that in all cases the bowels be kept regular. If purgatives are required, *Magnesia sulphate* or *Calomel* should be selected.

## Cirrhosis of the Liver.

(***Hob-nailed liver; gin drinkers' liver; chronic interstitial hepatitis; fibrous hepatitis.***)

The early symptoms of cirrhosis of the liver are usually of such an indefinite character, that one can rarely make a diagnosis with a fair degree of certainty. Nevertheless, the indications for treatment are clear, although, owing to the absence of symptoms indicating a serious illness, the patient

is not likely to carry out the physician's directions with the systematic care his case demands. This is unfortunate, for it is in the early stages only that we can expect good results in stopping the onward progress of the lesion.

The *sine qua non* in the management of hepatic cirrhosis is total abstinence from all alcoholic beverages. This rule should be so absolute that the physician should observe care lest he order medicines in the form of tinctures which contain a goodly percentage of alcohol, In those cases in which the patients lack the moral stamina to refrain entirely, and insist upon indulgence at periods, the alcoholic beverage should always be taken very freely diluted and after meals. In this way, the effects of the poison upon the liver are minimized, though by no means avoided.

In the advanced stages of hepatic cirrhosis, total abstinence from alcohol is of little or no value ; indeed, it may, as suggested by Cheadle, hasten the fatal termination. Certainly, such cases die with more comfort if moderate alcoholic indulgence is permitted.

The overwhelming predominance of alcohol as a cause of hepatic cirrhosis has led to the neglect of other etiological factors in the way of dietetic irregularities. It is important that in all cases the patient be forbidden highly seasoned food, coffee, spices, etc.

The patient should be ordered a diet which throws the least possible work upon the liver, and at the same time reduces the possibilities of fermentation and auto-intoxication via the gastro-intestinal tract to a minimum. For this purpose there is no better food than milk. The patient should be kept on a strict milk diet for a period of six or seven weeks, if possible. With the necessarily restricted nutriment this diet affords, it is highly important that the patient be kept at absolute rest in bed or on a couch or reclining chair. If ordinary milk disagrees—and statements to this effect by the patient must not be too quickly accepted by the physician—then various milk foods may be substituted, or the milk may be modified in one way or another. Thus, the patient may be fed peptonized milk, koumyss, skimmed milk, or buttermilk ; or it may be rendered more acceptable by the addition of Bicarbonate of soda, Vichy or Apollinaris water, or flavored with a minute quantity of coffee, tea, or chocolate.

In many instances the stomach is unduly irritable, owing to an associated chronic gastric catarrh. Under such circumstances, it may be necessary to withhold all food by the mouth for several days, and feed the patient by the rectum.

Should milk fail to be of benefit, or when the case has progressed favorably, there may be added to the diet such simple foods as eggs, weak soups, purees, broths, and bread or toast. Fatty food is usually badly borne. With further improvement, additional articles may be permitted as experience with the case in hand dictates. As a rule, the heavy meats

are not found suitable. Carbohydrates and sugars are very liable to produce fermentation; hence, they should, as far as possible, be eliminated. Of these, white bread will prove the most acceptable. Green vegetables and stewed fruit may also be added to the diet to insure variety. Under no circumstances should food be highly seasoned or spiced.

Tea and coffee in moderation are permissible in cases which are not far advanced.

Tobacco is unquestionably of no advantage, and in many instances must increase any existing indigestion. When such is the case, it should be positively forbidden. Still, it must be borne in mind that the patient has a hard task before him in conquering his alcoholic craving, so that it is ofttimes the wiser plan to permit an indulgence in the less harmful habit.

In the early stages of the disease, when the main feature is, as already stated, a chronic gastro-intestinal catarrh, treatment at some mineral spring resort may be advised when the patient's circumstances will permit. The advantages to be obtained are found in the well-regulated life at such places, and the freedom from temptation. The places which enjoy the greatest reputation for the spa treatment are Carlsbad, Harrogate, Vichy, Baden-Baden, Marienbad, Homburg, and French Lick Springs.

Benefit may also be derived from the regular administration of some of these spring waters at the patient's home. Thus, Carlsbad, Hunyadi, Apenta, Veronica, and other waters may by reason of their laxative qualities keep the intestines fairly clean. They are especially useful in cases in which constipation is a prominent feature.

When vomiting is a troublesome symptom, the stomach should be placed at complete rest for a few days, and rectal feeding instituted. When dependent upon a gastric catarrh, lavage will prove useful. Hæmatemesis attendant upon cirrhosis of the liver demands the same treatment as in cases in which it originates from other lesions.

For the relief of flatulence, Rolleston recommends intestinal antiseptics, as Creosote, Thymol, Salol, Bismuth salicylate, and small doses of Calomel.

For atonic dyspepsia, which is not an infrequent concomitant, old-school authorities recommend Strychnia and dilute Hydrochloric acid.

The hepatic pain which is sometimes found in cases of cirrhosis of the liver is usually due to active congestion of that organ; hence, it requires for its relief the special measures already outlined for the treatment of hepatic congestion.

In the latter stages of hepatic cirrhosis, we have to deal with ascites and toxæmia as the important conditions. The latter is always a very serious matter, ofttimes irremediable. The best results are to be obtained by free administration of normal saline solution by hypodermoclysis or venous infusion.

Ascites is best treated by repeated and early tapping. In times gone-by, it was the custom to defer tapping until the last possible moment, owing to the fear that harm was done by this simple operation. Undoubtedly, in pre-antiseptic days, infection occasionally occurred, and the fatal termination was hastened thereby. With perfect antiseptic technique, there is no reason why the operation should be followed by any complications. The most important argument advanced against early tapping was that the repeated removal of large quantities of a fluid deprived the patient of albumen and so led to anæmia. Experience does not bear out this claim; besides, it is hardly possible that removal by tapping can do as much harm as purgation. On the other hand, there is every reason why the operation should be undertaken early. The long retention of the fluid acts mechanically upon the thoracic and abdominal viscera, impairing their functions. By pressure upon the renal veins it lessens urinary excretion. It very frequently happens that diuretic remedies which were unavailing before the operation become active immediately afterwards.

Very little can be said in favor of the medicinal treatment of ascites due to cirrhosis of the liver. Purgatives which were at one time so popular have very properly been relegated to obscurity, as they accomplished but little, and exhausted the patient. Diuretics have proven for the most part absolutely inefficient. The only one that has been of any use in my practice is *Apocynum cannabinum*. Even this is unsatisfactory, and at times proves objectionable owing to the nausea it occasions. Hare reports one case in which he used the fluid extract of *Asparagus* in drachm doses three times daily.

The results from surgical treatment of ascites from cirrhosis of the liver are not very encouraging, owing to the large mortality, the number of patients not benefited, and the small percentage cured. It has been suggested, and probably with good reason, that better results would have been secured had the cases been subjected to surgical treatment earlier in their course. To this we may reply that the appearance of ascites, which is the indication for operation, is always an advanced symptom of cirrhosis. Again, we must remember that the majority of the patients are the subjects of extensive degenerations or organic changes sequential upon the abuse of alcohol. A sufficient number of cures have been reported to force us to give operative treatment serious consideration. It is our duty, however, to state the case plainly to the patient that he may understand the risks. We should also eliminate as beyond the surgeon's sphere those cases in which other organic lesions than hepatic cirrhosis exist.

**Medicines.**—Of the remedies which have been proposed for the treat- of cirrhosis of the liver, Potassium iodide and Gold chloride are unquestionably the most important, because they give the best results. Potassium iodide is useful even in cases without a syphilitic history, though it is to be

regarded as doubly indicated when the latter has been obtained. In the non-syphilitic cases, it should be given in moderate doses—*i.e.*, ten grains three times daily after meals and well diluted.

*Aurum muriaticum* is suggested because of its influence over connective-tissue formation. It should be given in five minim doses of the second decimal dilution three times daily.

*Phosphorus* is capable of producing in chronic poisoning an interstitial hepatitis with hypertrophy, and later an atrophy with a granular appearance, dropsy, gastric disturbances, and jaundice. Salzer, of Calcutta, India, is enthusiastic over the occasional good results of this remedy in cirrhosis. He says: "When we see that a man, in spite of moderation in diet, has been for months going from bad to worse, and that after he began to take Phosphorus he began gradually to rally, we may fairly ascribe the improvement to the curative action of the drug administered. And this is what I have seen in a few cases."

*Ptelea trifoliata* and *Carduus marianus* are suggested by Hughes.

*Mercurius* is recommended by Piedvache, especially in cases of hypertrophic cirrhosis.

*Nux vomica*, *Bryonia*, *Cinchona*, *Arsenic*, *Ammonium mur.*, and *Lycopodium* should be studied as having symptomatic relationship to cases of cirrhosis of the liver.

## Surgical Treatment of Hepatic Ascites.

By W. B. Van Lennep, A.M., M.D., Professor of Surgery, Hahnemann Medical College of Philadelphia.

Recognizing that tapping is in most instances only palliative, and but the beginning of the end, operation has been undertaken with a view of establishing a communication between the portal and the systemic veins. The operation of Talma consists in fastening the omentum to the anterior parietal peritoneum, sometimes the spleen as well, and even inducing adhesions between the liver and diaphragm (epiplopexy, splenopexy, hepatopexy). There have been enough successes to warrant giving the operation a legitimate place. Occasional tappings are necessary to help remove the fluid, and the superficial veins of the abdomen become enormously distended, and the ascites gradually disappears. The anastomoses are between the lumbar veins and the epigastric, the gastric œsophageal, and those of the capsule of Glisson and the phrenic. The operation should be performed early, as the presence of jaundice is considered a contra-indication; so, too, are of course marked cardiac and renal lesions, hæmorrhages, etc.

## Fatty Liver.

Fatty liver is always but a part of a general condition, *i. e.*, general obesity, anæmia, and cachectic states, of which tuberculosis is an important

one. It is not an easy matter, therefore, to speak of its treatment apart from its associated conditions and the causes which give rise to it. In fact, one is seldom called upon to treat it as a separate clinical entity. When the disease is one of the manifestations of obesity, the diet must be regulated as directed in the chapter of this work referring to the treatment of such a condition. It is of special importance to exclude starches and sugars from the dietary. Systematic exercises must be instituted, and inasmuch as these cases represent advanced stages of obesity, such exercises must be conducted under the immediate supervision of the physician or of a teacher who understands his patient's needs. In well-advanced cases, little or nothing can be accomplished by calisthenics; indeed, it may prove better for the comfort of the patient if he is permitted to rest in peace.

When associated with anæmic states, *Arsenic* is decidedly the best remedy. For instructions as to the use of this remedy in this connection, the reader is referred to the section on Pernicious anæmia. *Iron*, though a valuable remedy in chlorosis, is not likely to have much of a sphere of utility in the fatty degeneration of anæmia. *Iodoform* is known to be capable of producing fatty degeneration, but I am not aware that it has been used clinically to any extent.

Remedies to be considered, in addition to the above, are *Phosphorus*, *Ammonium mur.*, *Chionanthus*, *Leptandrin*, *Nitric acid*, *Chelidonium*, *Antimonium crudum*, and *Phosphoric acid*.

## Amyloid Liver.

The consideration of the treatment of amyloid disease of the liver as a clinical entity seems hardly appropriate, for this lesion is, strictly speaking, a terminal event of some incurable disease, as suppuration, tuberculosis, etc., which of itself demands serious consideration. Owing to improved surgical methods, it is rarely observed at the present day. If we were dealing with the degeneration in the liver alone, the outlook would not be so unfavorable. The serious feature lies in its association with degenerative conditions of other important organs. Some prospect for cure by improved methods may be offered, for Lubarsch—quoted by Rolleston—has shown experimentally that lardaceous disease may pass away entirely. Syphilitic cases also offer a favorable prognosis when not too far advanced. Many cases pursue an uneven course, characterized by ameliorations and exacerbations over a term of years.

The treatment of amyloid disease of the liver lies in the discovery of the primary cause and its removal. The administration of remedies directed against amyloid disease *per se* is useless, though Potassium iodide has found some advocates. *Aurum muriaticum*, *Mercurius*, and *Ammonium chloride* are stated to have given good results.

The long-existing suppuration must be treated on sound surgical prin-

ciples. Tuberculosis cases should be treated in the open air, and put at complete rest with highly nourishing food.

Syphilitic cases require *Potassium iodide* in large doses, as advocated in the section on the treatment of syphilis.

The remedies which will be found to give the best results are those having a relationship to chronic suppuration, as *Hepar*, *Nitric acid*, *Calcarea fluorica*, *Fluoric acid*, *Iodoform*, and *Silicea*.

Constipation, diarrhœa, œdema, etc., require symptomatic treatment, as advocated in other portions of this work.

## Malignant Disease of the Liver, Gall-Bladder and Bile-Ducts.

The prognosis of malignant tumors involving the liver, gall-bladder and bile-ducts is bad, as in malignant disease of other viscera. The only hope resides in surgical intervention. In the case of carcinomata of the gall-bladder and bile-passages, something may be done by way of prophylaxis, as it has now been all but mathematically proven that gall-stones are the chief cause of malignancy in these situations. It is a logical deduction, therefore, that gall-stones which give evidence of irritating the bile-passages should be removed, especially so in persons who give a family history of cancer.

Carcinoma of the liver offers a very unfavorable field for surgery, because practically all cases are secondary to malignant tumors elsewhere. It is only when the tumor is diagnosed in its early stage and is primary that any hope of cure can be offered. The operation advised is a partial hepatotomy. The mortality has been very large in the few cases in which it has been attempted, made so by its inherent difficulties, and by the liability to fatal hæmorrhage in those cases attended by marked jaundice. When an exploratory incision demonstrates that the tumor is not sharply circumscribed or is multiple, the proper course is to proceed no further, but to close the abdominal wound. In the successful cases, death usually results a few months later from recurrence of the tumor. Lucke, however, has reported a case in which the patient was alive five years after the operation. Hochenegg also reports a practical cure, the patient being alive three years after operation.

In the case of carcinoma of the bile-ducts, the prognosis is likewise unfavorable, though by no means as bad as in the case of cancer of the liver itself. The operation by preference is excision, followed by a cholecystenterostomy. When this is impossible, considerable benefit may be given the patient by establishing a communication between the gall-bladder and the intestinal tract, thus postponing the advent of cholæmia. Life has been prolonged for nearly two years by this palliative operation.

Cases which are not submitted to operation must be treated sympto-

matically, the special features demanding attention being the pain, the digestive disturbances, the prostration, jaundice, and ascites. Pain is best relieved by the hypodermic administration of Morphia. No hesitation should exist respecting resorting to this drug, for in a fatal illness like carcinoma of the liver the production of a drug habit is not of the slightest moment. Opiates by the mouth are objectionable, as they tend to disturb digestion.

Digestive disturbances, as flatulence, vomiting, gastric discomfort, constipation, diarrhœa, etc., are to be treated according to indications found elsewhere in this work, diet and rest being the most important therapeutic factors.

Prostration demands that the patient be given as nourishing food as circumstances will permit, together with such remedies as *Arsenicum* and *Chininum arsenicosum*..

The jaundice is practically always a hopeless factor, as it depends upon the pressure exerted by an irremovable tumor. The associated itching requires the same measures as when it occurs as a concomitant of jaundice from other causes.

Ascites demands frequent tapping.

Remedies are practically useless. *Arsenicum, Lachesis, Conium, Chelidonium*, and *Hydrastis* have been advised.

## Jaundice.

(*Icterus.*)

Jaundice is but a symptom; hence its treatment must be that of the condition which has given rise to it in any given case. Still, it is a clinical manifestation of such pronounced character as to demand special consideration at the hands of all medical writers. In many cases, the lesions which give rise to it are of an incurable character, *e.g.*, those examples produced by pressure of malignant tumors upon the common duct. From the standpoint of the medical man, the variety which is of the greatest interest to him is that produced by catarrh of the bile-ducts. Such jaundice is of the obstructive variety, and is believed to be due to swelling of the mucous lining of the common duct or its obstruction by a plug of mucus. Of hæmo-hepatogenous jaundice we can say but little respecting its special treatment, as it is a manifestation of extensive blood changes, as in yellow fever, dengue, and other diseases. Measures directed against it are purely medicinal.

In the following pages I shall take catarrhal jaundice as the type, the treatment of which is to be presented. Although in the majority of cases, the patient experiences but little discomfort aside from a few symptoms of indigestion, as flatulence and constipation, it is a wise routine practice to order him to bed until such time as convalescence is fully assured. In cases presenting fever no one will dissent from this plan. The writer be-

lieves firmly in the value of keeping all cases at rest, for physical activity demands greater quantities of food for nutrition—quantities of food, indeed, too great for the digestive apparatus to take care of. Besides, physical rest is nature's great remedy for inflammatory lesions. If carelessness as to rest is permitted, it is possible for an acute cholangitis to be converted into an acute or chronic cholecystitis, either of which will demand surgical interference for its cure.

Next to rest, diet is the important desideratum. As in acute disorders of the gastro-intestinal tract, we order a limited supply of nourishment, as the patient is presumably in good systemic condition. Fats must be strictly prohibited. Alcoholic drinks are useless therapeutically, and are capable of doing harm. They must, therefore, be forbidden excepting in the cases of patients who have been regularly addicted to their use. Under the latter circumstance we must rest satisfied with restricting their quantity, and ordering their free dilution before taking. The ideal nutriment is milk, plain or peptonized. Some physicians advise that it be skimmed or given as buttermilk or koumyss to avoid the cream. It is very doubtful if the limited quantity of fat found in commercial milk is sufficiently great to interfere with digestive processes. We may also order during the acute stage nutritious broths containing rice, peptonized gruels, and egg-albumen. As the patient improves, and the escape of bile into the intestinal tract is evidenced by the changed color of the stools, we may allow eggs, fish, chicken, and small quantities of vegetables. Even then we should continue to make the milk and broths form the principal portion of the diet until good health is regained. In any event, the patient should be fed small quantities and at relatively short intervals.

Water is universally admitted to be an invaluable remedy for jaundice. It is asserted that it thins the bile, and makes its flow more certain. It certainly aids the cleansing of the stomach and duodenum. Alkaline drinks are especially valuable in this connection, so that whenever the circumstances of the patient will permit, we should order such natural spring waters as Carlsbad, Congress, Vichy, and French Lick.

Locally, we may accomplish something by hot applications to the region of the liver. The measures most commonly in use include hot flaxseed poultices and compresses wrung out in hot water, and renewed as frequently as they become cool. East Indian physicians are strongly in favor of compresses wrung out in hot nitro-muriatic acid solution, in the proportion of one drachm of the acid to one pint of hot water. This practice is now recommended by many physicians.

The injection of cold water (temp., 60° F.) high into the colon acts favorably by stimulating intestinal peristalsis and promoting the dislodgment of the obstructing plug of mucus from the orifice of the common duct.

Jaundice, itself a symptom, is associated with other symptoms which ofttimes call for special measures for their relief. Those that attract our attention the most frequently are the pruritus, indigestion, constipation, vomiting, diarrhœa, and toxæmia.

The *pruritus* is usually alleviated by one of the following measures: Plain hot baths; hot sponging; sponging with carbolic acid solution, 1:60; the nitrohydrochloric acid bath in the proportion of one ounce to the gallon of water (wooden tubs must be used for this bath); powdering the skin with plain talcum; bathing or sponging in Bicarbonate of soda solution; hypodermic injections of Pilocarpine; diaphoresis produced by taking of hot drinks. Respecting the Pilocarpine, the drug should be administered in doses not exceeding one-sixth of a grain twice daily.

The *indigestion* is to be combated by the dietetic precautions already mentioned. *Fresh* inspissated ox-gall, in five grain doses, given one hour after meals, will prove of value. The action of this substance will be enhanced if it is given in keratin-coated pills, so that it will pass into the duodenum unaltered.

The treatment of the *constipation* requires good judgment. The prevalent practice is to administer purgatives and laxatives indiscriminately, the sole aim being to produce excessive fæcal evacuations. Such procedures will, in a certain percentage of the cases of catarrhal jaundice, increase the duodenal inflammation, and aggravate the primary condition it is intended to relieve. Calomel and other drugs recommended to increase the flow of bile should be unqualifiedly condemned. If the jaundice is due to obstruction, it is irrational to cause increased biliary secretion, which must, perforce of circumstances, be retained back of the obstructing lesion. The most satisfactory method of promoting regular bowel movements is by Sodium phosphate or Carlsbad salts, giving just sufficient of either to produce easy movements.

The daily evacuation of the bowels is probably the best means of maintaining intestinal antisepsis. The ox-gall pills, as recommended above, will also prove of value in this respect. The so-called intestinal antiseptics as Salol, Naphthol, Naphthol bismuth, Eudoxin, Carbolic acid, etc., as recommended by various authors, are of very doubtful value.

The *vomiting* is to be treated as in cases occurring apart from jaundice. *Cerium oxalate*, *Sodium bicarbonate*, and *hot water* have been especially recommended.

The **diarrhœa** demands that the patient be kept on a strict milk diet. When the stools are small and frequent, enteroclysis will be of value.

**Toxæmia** is rarely observed in connection with catarrhal jaundice. It is, however, a prominent feature of the obstructive jaundice dependent upon irremediable organic lesions. The kidneys being the principal organs by which bile is excreted in obstructive jaundice suffer especially, nephritis

not infrequently resulting. The toxæmia may be controlled, in a measure, by ordering copious drafts of water, milk diet, high colon enemata of normal saline solution, intravenous saline infusions, and diuretics. No special remedies can be directed against the hæmolysis which accompanies severe jaundice. At the best, we can but treat the cause; this being removed, the blood slowly resumes its normal condition.

Hæmorrhages constitute an unfortunate feature of the cases of severe and prolonged jaundice. Slight wounds bleed freely. This is a practical point from the surgeon's view, as hæmorrhage is one of the common causes of death after operation for the relief of obstructive jaundice, whether from gall-stones or from tumor. It has been recommended that the patient be given 5 to 15 grains of Calcium chloride three times daily for two days before the operation in order to lessen the hæmorrhagic tendency.

When the urine is scanty, and ordinary measures fail to cause it to flow freely, dry cupping of the lumbar region or the hot wet-pack have been recommended.

As for the medicines useful in jaundice, it will at once be appreciated that cases dependent upon mechanical obstruction, as from cholelithiasis and tumors, are amenable to surgical treatment only. The following suggestions, therefore, relate almost exclusively to catarrhal jaundice.

The following general therapeutic suggestions are offered:

**Jaundice due to anger**; Aconite, Bryonia, Chamomilla, Ignatia, Nux vomica.

**Jaundice from overloading the stomach**; Antimonium crudum, Bryonia, Hydrastis, Nux vomica, and Pulsatilla.

**Jaundice with much flatulence**: Carbo veg., Chamomilla, Cinchona, Lycopodium, Nux vomica.

**Jaundice with cholelithiasis**: Carduus marianus, Mercurius, Nux vomica, Podophyllum.

**Catarrhal jaundice**; Chelidonium, Chamomilla, Cinchona, Digitalis, Nux vomica, and Podophyllum.

**Malignant jaundice**; Aconite, Arsenicum, Arsenicum iod., Chininum arsenicosum, Chelidonium, Crotalus, Elaps, Lachesis, Picric acid, Vipera.

**Hæmorrhagic jaundice**: Chelidonium, Crotalus, Phosphorus.

**Icterus neonatorum**: Bryonia, Chamomilla, Nitric acid, Nux vomica, Pulsatilla.

**Jaundice from syphilitic disease**: Kali hydriodicum; Mercurius iod. ruber.

**Jaundice due to cardiac disease**: Digitalis, Strophanthus, Convallaria, and Adonis.

**Hæmatogenous jaundice**; Phosphorus, Arsenicum, and the serpent poisons.

*Chelidonium* is the favorite remedy of many physicians for catarrhal jaundice when the symptoms present are not sufficiently characteristic to suggest any particular medicine. It is especially indicated when there are pain under the right scapula and diarrhœa with clay-colored or yellowish stools. Burnett reported several cases of severe chronic jaundice cured by this remedy.

*Gelsemium* may be used on general principles in the early stages of catarrhal jaundice because of its influence over catarrhal processes in general. It is specifically indicated in jaundice with prostration, clay-colored stools; in passive congestion of the liver; so-called bilious diarrhœa.

*Nux vomica*, useful in jaundice, brought on by a fit of anger, over-eating, indulgence in alcoholic beverages, and abuse of purgatives; in cases dependent upon gastro-duodenal catarrh. Its indicating symptoms include headache with morning aggravation, nausea, vomiting, sensation of pressure in the epigastrium relieved by eructations, constipation, pruritus, especially in the evening; peevishness, irritability; hæmorrhoids.

*Myrica cerifera* is indicated in catarrhal jaundice in which the characteristic symptom is the vomiting of a tenacious, thick, nauseous secretion. Herein it bears some symptomatic resemblance to *Hydrastis* and *Kali bichromicum*. Additional symptoms include despondency, offensive breath, bitter taste in the mouth, poor appetite, weakness and drowsiness, and muscular soreness and aching.

*Hydrastis canadensis*, owing to its influence over catarrhal inflammations, should find a place in the treatment of catarrhal jaundice. It is indicated early in cases of gastro-duodenal catarrh; especially in patients with atonic dyspepsia; the stools are pale and scanty; faintness and gone feeling in the epigastrium; palpitation with faintness.

*Kali bichromicum*, judging from its general action and symptomatology, is indicated in cases of jaundice associated with duodenal ulceration. The patient complains of pain and stitches in the right hypochondrium, limited to one spot; clay-colored stools.

*Chionanthus* is commonly recommended for catarrhal jaundice. Its symptomatology would suggest that it is adapted to more serious cases. Uneasy, sore feeling in the right hypochondrium, liver much enlarged; constipation; stools clay-colored; urine very dark; bitter, sour eructations; offensive flatus.

*Carduus marianus.*—Jaundice with dull headache; bitter taste in the mouth, tongue white, especially in the middle, with the tip and edges red; nausea, with vomiting of acid greenish fluid; stools bilious; urine golden yellow; sensation of fulness in the region of the liver.

*Juglans cinerea.*—Jaundice with stitching pains about the liver; pain under the right scapula (*vide Chelidonium* and *Bryonia*); occipital headaches; stools are bilious or yellowish green, burning the anus, and associated with tenesmus.

*Bryonia alba.*—Jaundice brought on by violent fit of anger; pain under the right scapula; patient, though apparently hot, complains of feeling chilly; marked exhaustion; urticaria; extreme thirst; stools are hard and dry; thick, white-coated tongue; vomiting after eating or drinking.

*Chamomilla.*—Jaundice after violent fit of anger; icterus neonatorum.

*Cinchona.*—Jaundice following gastro-duodenal catarrh; liver swollen and sore on palpation; dulness and confusion in head; yellowish-coated tongue; stools whitish; offensive flatus; jaundice due to abuse of alcohol.

*Leptandra.*—Jaundice with vomiting of bile; aching pains in the region of the liver; profuse, black, fœtid stools, or clay-colored stools with diarrhœa.

*Iodine.*—Chronic jaundice; great emaciation; great hunger; vomiting after eating; frequent eructations; gastralgia; white, diarrhœic stools, alternating with constipation; organic lesions of the liver.

*Podophyllum.*—Jaundice associated with extreme constipation and hard, dry, clay-colored stools; fulness, soreness and pain in the region of the liver.

*Pulsatilla.*—Catarrhal jaundice; especially indicated in nervous women with menstrual derangements.

*Iodoform* was highly recommended by Bartholow as a remedy in catarrhal jaundice.

*Digitalis* should be prescribed in cases of jaundice in which the indications points to the heart as the primary source of the trouble.

*Phosphorus.*—Jaundice of malignant disease (*Arsenicum*).

*Ammonium chloride* has been highly recommended in material doses of the crude drug, because of its influence over mucous membrane inflammations, and its supposed ability to cause liquefaction of the bile.

## Gall-Stone Disease.

(***Cholelithiasis; gall-stone colic; biliary colic.***)

As to whether gall-stone disease shall be treated medically or surgically is a question over which warring factions have battled ever since modern surgery has made operations on the gall-bladder comparatively safe. On the one hand, it has been demonstrated that but few of the many individuals in whose bodies biliary calculi have been discovered at autopsy have suffered any ill-effects from their presence during life; while on the other, numerous cases have been reported in which the neglect of proper surgical intervention has either sacrificed a life or led to permanent invalidism.

When men of ability hold such diverse views it is hardly possible that they can be discussing the same aspects of a question. It is absurd to contend that every individual who is suspected with a reasonable degree of certainty of harboring gall-stones shall be subjected to surgical operation;

and equally so that all or nearly all cases presenting symptoms demanding treatment can be cured without the aid of the knife. Gall-stones do harm mainly by their migration. In exceptional instances only do they give trouble as long as they remain quiescent in the gall-bladder. Such cases do not have any occasion to consult either the physician or the surgeon; hence, their condition may be eliminated from the present discussion. They are of academic, and not of practical, interest. When, on the other hand, cholelithiasis produces symptoms or clinical evidences of cholecystitis, biliary colic, and other secondary pathological conditions, the question of medical or surgical treatment is a matter of individualization, and not one to be decided arbitrarily one way or the other according to the preconceived opinions of the physician or surgeon, as the case may be. It is, however, a good working rule, to regard all cases, for a time at least, as suitable for medical treatment, unless there are clearly-defined indications for early operative treatment. Such medical treatment resolves itself into a consideration of prophylaxis in persons who have already exhibited symptoms of cholelithiasis; of the treatment of attacks of gall-stone colic; and of the management of patients who exhibit chronic illnesses, the result of gall-stone migrations, or microbic infections.

**Prophylaxis.**—Every patient who has been the subject of an attack of gall-stone colic should be subjected to a course of treatment directed against the recurrence of such illness, and that irrespective of the certainty or uncertainty of the escape of the calculus or calculi through the common duct. This prophylactic treatment should be designed to favor the formation of healthy bile and its stagnation. The measures proposed and of value include attention to exercise, the wearing of proper apparel, and the regulation of food and drink. But little can be said in favor of treatment designed to dissolve or disintegrate gall-stones. In the first place, it is very doubtful if there is any known remedy which can produce that much desired result; and in the second place, the real disease is not the calculi, but the infections to which they predispose. There is no better remedy for avoiding these infections than the formation of the healthy bile and the promotion of its onward flow. Treatment with this end in view is essential even in cases which have been subjected to operation; for, as stated above, the disease is not the calculi *per se*.

It is always of paramount importance that the patient be considered as a whole, and all influences which tend to the production of passive congestion or other disease of the liver, and of gastro-intestinal indigestion be removed. To treat a patient as a case of cholelithiasis pure and uncomplicated is a therapeutic absurdity. His nervous condition must be studied, and any abnormality under which it works must be corrected. For example, many of the patients who suffer from the effects of cholelithiasis are overworked and worried business men. It is a fact that visits to distant springs, as Carls-

bad, remove patients from their worrying surroundings, and the restful life which they lead there that has given such places much of their reputation. Again, the association of liver troubles and worry is apt to establish a vicious circle. The hepatic patient usually assumes a mental state which causes him to magnify his sufferings ; this, in turn, increases his liver trouble. Still further, the patient ofttimes has more or less constantly in mind the prospects of operation. Worries then crop up on every hand.

The influence of pregnancy in favoring cholelithiasis is generally admitted. This cause we cannot eliminate, for pregnancy is necessary to the perpetuation of the race ; but any deleterious effects it may have may be greatly lessened by strict adherence to the hygienic management of patients both before and after delivery.

It is very necessary that the upper portion of the abdomen be relieved of constricting dress, as corsets and waistbands. Corsets should be discarded entirely ; and, as far as possible, clothing should be suspended from the shoulders. Tight clothing undoubtedly causes stagnation of bile.

For the stimulation of the flow of bile, the best remedy is food given at relatively short intervals. In fact, it is often desirable to go to the extreme of ordering the patient to take late suppers as a matter of routine. It has been demonstrated that during the intervals between meals bile is stored up in the gall-bladder. While bearing this fact in mind, the physician should not be too arbitrary in ordering frequent meals as a routine measure, for he should always bear in mind, especially in old cases of cholelithiasis, the condition of the patient's stomach and bowels.

The prevalent custom of ordering a certain restricted diet in gall-stone disease should be discountenanced. Keay even goes so far as to say that diet restriction has no rational basis. To quote him exactly : " The one thing of importance is that the diet be adapted to the ordinary requirements of the individual, and that it be well digested, as it is from the products of indigestion that the bile derives those irritating properties that lead to disease in the gall-bladder and bile-ducts."*

The construction of a diet list based upon the facts that certain foods contain cholesterin, and that the latter substance is the important constituent of biliary calculi, is pedantic and useless practice, because, by so doing, we must certainly undermine our patient's nutrition to a serious degree. If we follow the plan strictly—to quote Keay once more—" the consequence will be death, not from disease, but from starvation." Jankau contends that the introduction of cholesterin-forming foods has nothing whatever to do with the question at issue ; that the important point is the dependence of cholesterin formation in the biliary passages upon catarrh of these parts.

* J. H. Keay, M.D. *The Medical Treatment of Gall-Stones*, p. 102.

The prohibition of an *excess* of fatty foods is good practice, not because they bear any specific relationship to gall-stone formation, but because they tend to the production of gastric and intestinal catarrhs. It is probably through this action that gall-stones are found with great frequency in persons who have indulged freely in bacon and other fatty foods.

There can be no question also as to the advisability of forbidding excessive indulgence in starches and sugars.

Certain authors formulate very elaborate directions as to the feeding of patients who have had an attack of biliary colic. Such instructions, as a rule, are unwise, because they lead to a monotonous diet, and while correcting certain evils, as surely lead into others. After all, the best advice is that which provides for the administration of proteids, carbohydrates and fats in the proportions in which they are found in normal dietaries, avoiding alcoholic beverages, highly seasoned dishes, and excesses of all kinds. That plan which prevents or reduces to a minimum a chronic gastro-intestinal catarrh is always the best.

The good effect of drinking unusually large quantities of water is admitted by all authorities. The rationale of its action alone is disputed. For example, Thompson speaks of administering water "for the purpose of diluting the blood, and through it the bile." Keay, on the other hand, looks upon water as valuable mainly in clearing out the intestinal tract and freeing it from the products of indigestion. It is essential that the water be taken rationally. To this end, it should not be administered with meals, but always some time afterwards, when the stomach is comparatively empty. The patient should make it a regular practice to take from one-half to one pint of hot water the last thing at night and the first on rising in the morning. It is not always possible to give the gall-stone patient the necessary amount of water without disturbing his digestion. Under these circumstances, we may follow the practice advocated by Keay, of ordering regular rectal injections. After a thorough evacuation of the bowels by a cleansing enema, two quarts of water should be injected into the colon and retained. This procedure should be repeated every second or third night.

The *bowels* must receive proper attention. If constipation is not corrected by hygienic management and diet, regular evacuations must be secured by salines, *e.g.*, the Carlsbad salts.

*Exercise in the open air* is no less important than is the diet. Patients may declare that they are physically active, but investigation usually shows that their activities are limited to such movements as are incidental to office or household duties. The exercises to be recommended include walking, bicycling, golf, rowing, riding, all of which call the abdominal muscles into play. One objection may be urged against active physical exercise, namely, the possibility of dislodging a calculus and starting up an attack of colic, or leading to the perforation of an already ulcerated biliary passage. Either

contingency is of exceedingly rare occurrence, so, for practical purposes, we may neglect its consideration. The occurrence of either accident is to be regarded as an indication for operative interference.

*General massage* is beneficial in most cases, though in much less degree than exercise in the open air. It is to be advised only in cases of patients with cardio-vascular degeneration, to whom active exercise is harmful. *Local massage* of the gall-bladder and ducts to promote the onward passage of calculi is a practice to be mentioned only for the purpose of condemnation. The very few cases in which it has proved successful do but little in balancing the very many in which it has done great harm.

Alcoholic beverages of all kinds should be positively forbidden excepting in the few cases in which constitutional conditions or symptoms point unequivocally to their use.

The value of regular visits to certain mineral springs has been much discussed. Of these health resorts, Carlsbad enjoys the greatest reputation. The fact that patients who go there are much improved thereby has never been disputed, but it has been asserted, and with good reason, that much, if not all, of the benefit obtained originates in the restful open-air life and freedom from business cares and anxieties. The spa treatment may be recommended with advantage to persons whose finances will permit of the outlay; but it is far beyond the means of the average invalid. Even the regular use of the Carlsbad sprudel salt is a severe tax on the finances of many. Other mineral springs that have been recommended include Contrexeville, Kissingen, Homburg, Harrogate, Llandrindod, Bedford, Las Vegas Hot Springs, Sharon, White Sulphur, Carlistoga Hot Springs, Mt. Clemens, French Lick, Marienbad, Vichy, and Ems. These various waters differ greatly in their composition. So far as I know, there have been no attempts made to differentiate the class of cases suitable to each spring.

**The Olive Oil Treatment.**—No remarks on the treatment of cholelithiasis can be considered complete without a reference to the administration of Olive oil. Much has been claimed for this remedy, it having been asserted that it caused a solution of the calculi and their speedy appearance in the stools. There can be no question that the value of Olive oil has been grossly exaggerated. The so-called concretions found in the stools are now known to be saponaceous masses resulting from a chemical combination of certain of the fæcal constituents with the Olive oil. I find, aside from this, that there are many physicians who express great faith in this remedy. Keay thus sums up the various possible reasons why Olive oil should prove useful in Cholelithiasis. "(*a*) Rosenberg found by experiment that Olive oil taken in large quantity increased the flow of bile. This he attributed to the demand from the oil and the fatty material in the duodenum for a larger quantity of bile to emulsify it. (*b*) Jankau found in experimenting on dogs

that the quantity of fats and soaps in the bile increased from 1.47 per cent., when the animal was fed on meat, to 4.89 per cent. when fed on fat and bread, and to 6 per cent. when fed on Olive oil. There can be no question that fatty and soapy materials act as solvents on gall-stones. Brockbank, for example, found that a mixed cholesterin stone lost 63 per cent. of its weight in two days. Provided that it could be demonstrated that fatty and soapy materials when excreted with the bile act as solvents of stones in gall-bladder and ducts, and that enough could be excreted for that purpose, Olive oil would deservedly occupy a high place in therapeutics. (*c*) It will be remembered that the outlet of the common duct is extremely narrow, and that a stone which has found its way through the rest of the ducts frequently gets fixed at this point and ulcerates into the duodenum. One can readily understand how oil and soapy materials passing into the duodenum would come in contact with a stone, and if there be any reason to conclude that a stone is fixed in this position, there is good reason for administering large doses of Olive oil. (*d*) At the International Congress of Medicine in 1900, Dr. Paul Cohnheim gave the results of some investigations which have a rather direct bearing on this point. He found that cases of dilatation of the stomach dependent, not on an organic obstacle, but on spasm of the pylorus following an ulcer or fissure, or on a cicatrix at the outlet of the stomach were markedly improved by large doses of Olive oil; that stenosis of the pylorus and duodenum characterized by continuous secretion and pyloric spasm after the principal meals were improved or completely cured; and that in ulceration the oil acted as a narcotic. . . . . In a word, there is much to be said in favor of Olive oil, provided it is not regarded as a specific and used only in suitable cases."

**Medicinal Treatment.**—No remedy or class of remedies can be said to bear any specific relation to cholelithiasis. Prescriptions must be based upon special constitutional characteristics of the patient, or directed against an underlying or associated gastro-intestinal catarrh or hepatic disorder. Even *Cinchona*, which so many of our school have lauded, is by no means a specific. It is to be regarded as of value in some cases. *Nux vomica* will probably be indicated symptomatically as frequently as Cinchona. Several writers have praised *Calcarea carb.*, but it is almost certain that they have been favored by Dame Nature, and their good results will not be continued over an extended series of cases. The same may also be said of numerous other remedies.

The medicines which may be suggested as of possible utility include Chelidonium, Colocynth, Lycopodium, Carduus marianus, Chionanthus, Iris versicolor, Euonymin, Dioscorea, Hydrastis, Myrica, Eupatorium, Belladonna, and Bryonia.

Of remedies recommended by the old-school physicians, Sodium

salicylate is at present in most favor; but very few physicians speak of it with much more than a lukewarmness that does not encourage one to give it an extended trial.

**Treatment of Gall-Stone Colic.**—The main indication in the treatment of gall-stone colic is the relief of pain until such time as the offending foreign body is dislodged or enters the intestinal tract. It is a good general rule to avoid the administration of analgesics as much as possible. The attacks are exceedingly prone to recurrence, and it is a very easy matter for these patients to acquire a drug habit. When the pain is not severe, simple hot applications will suffice. In others, probably the majority, we must have recourse to remedies to act specifically in obtunding the pain. Of these, Morphia is unquestionably the most efficient. It should be given hypodermically in one-quarter of a grain doses, which may be repeated as often as every four hours without danger if necessary. Exceptionally, the administration may be at shorter intervals than just stated, when the pain is severe, and is but slightly modified by the previous dose. The physician should bear in mind that pain is *per se* a physiological antidote to the effects of Morphia. It may happen, after giving the drug at rather frequent intervals, the calculus escapes into the intestinal tract, and the physiological effects of the drug assert themselves to a degree which may occasion considerable anxiety. The effect of the Morphia in bringing relief will be enhanced if the first one or two doses are combined with $\frac{1}{120}$ of a grain of Atropia sulphate, and $\frac{1}{100}$ of a grain of Glonoin. These latter drugs act by reason of their influence in relaxing involuntary muscular fibre. It is unwise to repeat the Atropia more than once, because of the frequency with which it produces delirium and other symptoms. The hypodermic administration of the above-named drugs must be kept entirely under the strict observation of the physician, as their repetition depends upon good judgment and not upon any *a priori* rules.

When everything goes well, and the attack subsides, the patient should be confined to his bed at absolute rest until all residual pain and tenderness have disappeared; otherwise, the chances of a chronic calculous cholecystitis (which are always good even in the most promising cases), are greatly enhanced.

Should relief be not as prompt as one would desire, the case will almost certainly have a better future if operated early, rather than expose the patient to the dangers attendant upon the various affections secondary to cholelithiasis.

## Indications for Operation in Gall-Stone Disease.

By Wm. B. Van Lennep, A.M., M.D., Professor of Surgery in the Hahnemann Medical College of Philadelphia.

In a general way it may be said that operation is indicated whenever gall-stones are known to be present; that they are an incident to bacterial infection which is always present; that a good proportion of biliary colics are not due to stone, but to inflammatory swelling of the duct and the forcing out of thick mucus by spasm of an inflamed gall-bladder. Patients should be warned of this possibility before operation, as it is often mortifying not to be able to produce the stone! Drainage cures the catarrh which is present, in either case. Operation is rarely called for during an attack of colic; rather for its persistence with intermissions, usually indicating impaction of a stone. Pain, across to the left, occasionally also around to the right inferior angle of the scapula, suggests cystic-duct location, and jaundice is usually absent. Tenderness at the Mayo-Robson point (one-half way from the tip of the ninth rib to the umbilicus), with pain running to the umbilicus, is a strong evidence of common-duct stone. Jaundice is usually present, but may be intermittent or even absent. The stone is usually about the middle of the duct or at the ampulla of Vater. In the latter instance, pancreatic disease is not infrequent by retrojection of the stronger biliary stream, which is infected, as already stated. Hepatic duct calculus is hard to recognize. The jaundice is usually deep; the tenderness deep; the pain high and referred to the scapula or shoulder.

Common duct-stone is removed by choledochotomy with subsequent suture, either along its course or from the outside, and thus behind the duodenum when in the ampulla; or the latter may be reached by opening the duodenum and slitting up the papilla major. It is usually good practice to drain by opening the gall-bladder to cure the cholangitis and relieve tension on the sutures. If the stone cannot be removed, or the duct is strictured beyond repair, the biliary stream can be diverted by way of the gall-bladder into the duodenum, jejunum, or even the colon by an anastomosis between them—a choledystenterostomy. This is often supplemented by an entero-enterostomy to prevent intestinal infection from entering the gall-bladder and ducts.

Hepatic duct-stone is treated by choledochotomy and suture or sometimes by tube-drainage of the duct. The operation presents many difficulties and has a high mortality.

Cystic duct-stone is usually removed through the gall-bladder, which is afterwards drained for a time. If the calculus has produced ulceration and stricture, cholecystectomy becomes necessary to prevent a permanent mucous fistula.

In the average patient who has had one or more attacks of biliary

colic, the stone having been presumably passed or slipped back, careful attention should be paid to the region of the gall-bladder. Discomfort, pain, and especially tenderness, with a corroborative rigidity perhaps, in the interim of attacks, are clear-cut indications for operation. They show the presence of a cholecystitis which progressively renders operation more difficult, and induces complications which involve neighboring organs and structures. Thus, the thickened walls contract, as does all cicatricial tissue, until the gall-bladder becomes so small that it is useless, cannot be drained, and requires a difficult and more dangerous cholecystectomy. Extra-cystic lesions soon follow, and these may become so numerous and dense as to make it impossible to find or dig out the miniature gall-bladder. Again, these adhesions sooner or later hang up the pylorus or duodenum, and distort the stomach with a consequent dilatation, catarrh, ulcer, etc.

If the stone blocks the outlet, hydrops usually develops until the gall-bladder forms a tense tumor extending over the abdomen to varying degrees. Such an organ must, of course, be opened and the obstructing body removed, but in most cases a partial or complete cholecystectomy is necessary here as well. Pure hydrops does not usually go on as such indefinitely, but infection adds pus, and empyema of the gall-bladder results. This may progress slowly and become protected by adhesions, but it is even then at best an encysted abscess, which must be dug out and the sac excised. If the infection be more virulent, gangrenous cholecystitis is produced with peritoneal infections, much like those from acute appendicitis. In fact, the course is much like the latter disease, excepting that a tumor can usually be traced to the rib border.

Finally, it should be borne in mind that malignant disease occasionally develops in the walls of the gall-bladder or the biliary ducts, While rare, the exciting factor appears to be irritation from calculi and catarrh. When the tumor is large enough to be palpated in the one instance and the stricture is tight enough to produce jaundice in the other, the disease has usually extended into the surrounding tissues and is incurable. In contrast with the dangers and difficulties above enumerated, it may be added that cholecystotomy for removal of calculi, and the drainage to cure the catarrhal cholecystitis and cholangitis, is an operation both simple and safe. Furthermore, such a statement should not open the door for indiscriminate operations, for the indications are as clearly defined as those for an interval appendectomy.

# CHAPTER XIII.

## DISEASES OF THE NOSE.

### Acute Rhinitis.

A PROPER appreciation of the causes of acute rhinitis is a very important factor in determining the best prophylactic treatment in those who suffer frequently from the disease. That exposure to cold is an important causative agent every one admits; but that it is the only determining factor is very doubtful. There is much in the personal equation. Individuals predisposed to acute coryza should make it a rule to live a life in the open air, or at least spend a part of each day out-of-doors. It is remarkable to note how infrequently persons who are exposed to all kinds of weather, day after day, contract acute rhinitis. Daily outings constitute the most important prophylactic agent against the acute coryza of infants. Parents will find, that if, from the beginning, infants are sent out regularly each day, regardless of temperature, very few of them will ever "catch cold." Of course, due regard must be had to clothing; while carefully protecting the child, the other extreme of too much clothing must be avoided.

Remaining in rooms at an unduly high temperature, *i. e.*, 80° or over, is a cause among surgeons, who ofttimes have to swelter in operating-rooms, and, shortly afterwards, are obliged to go into the cold open air. The habitual residence in rooms having a temperature of over 70° F. is unquestionably bad.

Children and adults alike should sleep in well-ventilated rooms.

Cold sponging, immediately after rising in the morning, is a very good practice.

All persons who "take cold" frequently, should have their nasal and pharyngeal cavities carefully examined, and any chronic lesions, especially post-nasal adenoids, treated or removed.

The treatment of an attack of acute rhinitis is usually a very simple matter, the observance of common sense precautions and internal medication being sufficient to bring about a prompt cure.

As a rule, it is not necessary for the patient to remain in bed or in his room. The exceptions are found in cases presenting an initial fever, and those of severe grade, especially if the weather is unduly cold, wet or windy, and the patient's occupation involve considerable exposure to the elements.

Among the laity it is a very common practice to take two or three

fairly large doses of Quinine to abort "the cold." So far as I have been able to observe, this prescription is practically useless. Another lay remedy is the Turkish bath, and this, likewise, is not to be advised. It more frequently does harm than good.

The internal medication is efficient in the vast majority of cases. Experience teaches that with most individuals, some one remedy acts as a specific in the colds to which they are subject. Thus, Duncan Bulkley advocated several years ago the routine treatment of acute coryza by the administration of large doses of Sodium bicarbonate as an abortive remedy. To be efficient, it must be given early in the course of the disease. Fifteen to twenty grains administered every hour proves efficient. In my own case, as also in that of several of my patients, it acts wonderfully; but in the majority of instances it is a dismal failure. The remedy which suits the majority of cases in the beginning is *Gelsemium*, which should be given in doses of one to three drops (one drop doses usually suffice) every hour. Some assert that good results are dependent upon very early administration. While this is desirable, my experience is favorable even when Gelsemium is given during the stage of profuse coryza.

*Belladonna* and its alkaloid, *Atropia*, are also very efficient in selected cases. These drugs constitute one of the ingredients of many of the coryza tablets in common use. I have seen a single dose of one two-hundredth of a grain of Atropia, given in the evening, put a complete stop to a coryza so profuse as to threaten to keep the patient awake by reason of the obstructed nasal respiration, and the flow of mucus into the post-nasal space.

*Aconite* is very efficient early in the course of a coryza when there is fever with restlessness, with chilly sensations and frequent paroxysms of sneezing. As a rule, such colds have been brought on by exposure to dry cold winds.

*Allium cepa* should be prescribed for cases attended by a profuse watery coryza, which irritates the skin about the upper lip. It is not uncommon for the Cepa "cold" to be followed by an extension of the catarrhal inflammation to the larynx and trachea, in which case it should be followed by *Phosphorus*.

*Camphor* is a favorite remedy with some practitioners, who assert that two or three drops of the tincture, administered every hour, will abort the whole attack.

In the second stage of acute rhinitis, *i.e.*, when the discharge has assumed a muco-purulent character, the remedies that will be found of service includes *Pulsatilla*, *Kali bichromicum*, *Hydrastis*, and *Hepar*.

*Pulsatilla* is indicated in cases in which the discharge is of thick yellowish mucus, bland in character; patient finds relief in the open air.

*Kali bichromicum* has a thick nasal discharge, which is of stringy char-

acter. It is ofttimes associated with cough, the expectoration being of a thick stringy mucus. Headache is often present, and alternates with the coryza.

*Hydrastis canadensis* is suited to cases in which the posterior nares is especially involved, as shown by the thick secretions in that locality. The patient complains of rawness in the chest and throat. The discharge is scanty in a warm room and profuse out-of-doors.

*Sambucus* is indicated in acute rhinitis in infants when the discharge is of a tenacious, thick mucus, and causes the child to start from sleep as if suffocating. Obstruction of the nasal passages is a marked feature.

*Hepar* is adapted to cases in which sensitiveness to drafts is a prominent feature. Indeed, slight exposure may cause one attack after another. The nose is swollen and sore to the touch, especially inside of the alæ or wings of the nose, probably due to a small pustule in that locality.

*Sanguinaria* should be prescribed in cases in which there is associated involvement of the accessory sinuses.

*Euphrasia*, in cases in which the coryza is associated with a conjunctivitis, with an acrid discharge of clear mucus.

*Kali sulph.*—Bright orange-yellow discharge, and in cases where Pulsatilla, though apparently indicated, fails to give relief. (H. S. Weaver.)

Many have been the local measures suggested for the relief of acute rhinitis. Many of them are troublesome of application, and still more are useless. Cocaine at one time had great popularity, and is still used by some because of the prompt relief it gives to the symptoms. In practically all cases it may be regarded as a pernicious drug. Although it does bring great relief, the secondary relaxation of the bloodvessels caused by it makes it harmful. Adrenalin produces similar effects to Cocaine. It is not believed to produce the serious after-effects of Cocaine.

Of all the palliative local applications, *Menthol* stands at the head, as being efficient and free from possible unpleasant after-effects. Its good effects are tersely stated by Lennox Browne* as follows: 1. It stimulates to contraction the capillary bloodvessels of the nasal passages and throat. 2. It arrests sneezing and rhinal flow. 3. It relieves and dissipates pain and fulness of the head by its pain-killing and astringent properties. 4. It is powerfully germicidal and antiseptic. The most efficient means of application include spraying of a 2 per cent. solution in one of the bland oils, as albolene or paroleine; or as a snuffing powder composed of Menthol in sugar in the proportion of half of 1 per cent. It may also be used in one of the cheap inhalers with which the market is well supplied.

In the case of children it sometimes becomes a very important matter to keep the nasal passages cleared. For this purpose, Holt† recommends the following, which may be applied by medicine-dropper or spray:

* *The Nose and Throat and their Diseases*, p. 769.

† *Diseases of Infancy and Childhood*, 3d edition, p. 480.

| | |
|---|---|
| Adrenalin 1 : 1000, | ℥iss. |
| Acidi carbolici, | gr. v. |
| Acidi borici, | gr. xx. |
| Glycerini, | m. x. |
| Aquæ dest., q. s. ad. | ℥ij. |

Raue* recommends for children "the spraying or douching of the nose with a warm, mild antiseptic solution, such as Dobell's solution, or a normal saline solution, followed by spraying with a bland oil containing Camphor or Menthol in the proportion of one grain to the ounce. Later, as the discharge becomes profuse, frequent cleansing of the nasal passages becomes imperative. In infants or young children who struggle against the use of the atomizer, a small glass syringe may be employed, injecting into one nostril and allowing the fluid to flow out by the other, the child lying on its side during the operation."

## Abscesses and Fissures about the Alæ Nasi.

These belong to the class of annoying minor illnesses of life. As a rule, the patient complains more particularly of the resulting inflammation and swelling showing itself about the external surface of tip and wings of the nose. The lesion most commonly observed is a small abscess originating in a hair follicle. A very efficient treatment is the prompt opening of the latter, and the swabbing of the cavity with a fine probe tipped with pure carbolic acid. The symptoms subside at once.

Fissures are more difficult to handle. They are best treated by the insertion of a small tampon saturated with the following solution :

| | |
|---|---|
| Resorcin, | gr. xv. |
| Ol. amygdalæ, | ℥iij. |
| Glycerinæ, | ℥ij. |
| Alcohol, | ℥iij.—M. |

In many cases this fails, and we must resort to a local stimulant, of which *Protargol* in the strength of 20 grains to the ounce is the best.

At times, these small lesions may become a serious matter, in that they afford avenues for erysipelatous infection. Hence, the importance of their cure.

## Epistaxis.

(***Nose-bleed; Hæmorrhage from the nose.***)

As stated in my work on Diagnosis (p. 320) the majority of cases of epistaxis are unimportant, the hæmorrhage ceasing spontaneously within a few minutes. In many of these the hæmorrhage is a conservative process, the patient feeling the better for it. Such are the cases of epistaxis associated with cerebral congestion, amenorrhœa, and high vascular pres-

* *Diseases of Children*, 2d edition, p. 550.

sure. Many are the simple devices which have been found efficient in some of the cases. Thus, we may inject hot water at a temperature of 120° F. into the nasal cavity; apply ice to the back of the neck for its reflex vaso-constrictor action; apply ice to the side of the nose and at the same time have the patient keep ice in his mouth; have the patient lie in a recumbent posture with his arms extended over the head; make compression over the superior coronary artery where it crosses the superior maxillary bone; and in children, we may adopt Ivins's suggestion, namely, the forcing of a wad of paper between the upper lip and the teeth as near the nose as possible. There are cases, however, in which a fortunate result does not follow, and we are obliged to resort to energetic measures to save life or at least a debilitating loss of blood. Under these circumstances, our first duty is to make a careful inspection of the nasal cavities, and determine the nature of the lesion producing the hæmorrhage. Having discovered this, we should direct treatment to it exclusively. Sometimes it is due to the presence of a foreign body, which must be removed. When the lesion is near the introitus nasi, the bleeding may be stopped promptly by digital pressure for a minute. If this fails, we may apply small tampons saturated with an 8 per cent. solution of *Antipyrin*. Various astringent remedies have been recommended in this connection, as powdered alum, zinc sulphate, acetate of lead, sulphate of copper, etc., but the consensus of opinion is adverse to their use. For temporary alleviation of the hæmorrhage, we may make application of Cocaine hydrochlorate, 4 per cent. solution, or Adrenalin hydrochloride, 1 : 1000, both of which remedies produce a temporary anæmia of the parts. Their use is open to the objection that with subsidence of the ischæmia produced by them the bleeding commonly returns. They must then be used for temporary results only. Dr. H. S. Weaver has found Adrenalin useful at times as an internal medicine. Weaver also suggests the use of *Geranium maculatum* internally and locally as a wash as sometimes useful.

These measures failing, the bleeding vessel must be located—usually a very difficult thing to do—and the surface cauterized with the galvano- or the actual cautery; or we may make an application of a 15 per cent. solution of Chromic acid to the ulcerated surface.

Should these measures fail we must resort to plugging of the nasal cavity. A very simple expedient for this purpose is the introduction of an ordinary condom, the distal end of which is pushed far back towards the naso-pharynx. It is then inflated, its outward extremity tied. The condoms made of gold-beaters' skin should be selected whenever obtainable, as the elasticity of the rubber articles may cause great discomfort from occlusion of the naso-pharynx, to say nothing of the annoyance occasioned by their unexpected bursting.

Another method of plugging though less simple is very efficient, namely,

the packing of the nasal cavity with iodoform gauze. The physician takes two strips of gauze of double thickness, each two feet in length and one inch in width. A strong thread is attached to the end of the gauze to be inserted first. The first piece of gauze is passed far backwards in the inferior meatus, after which the balance of the strip, fold after fold, is inserted, until the channel is packed perfectly. The second piece of gauze is passed along the middle meatus in like manner, the string end first. Traction is then made upon the ends of the strings, and this causes the gauze packing to exert stronger pressure against the nasal walls. Finally, the strings are tied tightly over a padded stick lying across the nostrils. When using the Iodoform or plain gauze, it should first be saturated with some bland oil. This course will greatly add to the facility of the removal of the dressing.

Simpson's nasal tampon makes a nice dressing for packing the nares. It is easily introduced, and can be removed layer by layer without causing as much pain as the ordinary tampons (Weaver).

The old method of treating obstinate epistaxis by plugging the posterior and anterior nares with the aid of Bellocq's canula is now discountenanced. It is generally recognized that it is liable to excite post-nasal inflammation, middle-ear suppuration, and even more serious consequences.

*Hydrastinine hydrochlorate* 3x administered every half-hour is probably the best routine remedy for the epistaxis due to local causes.

When the hæmorrhage occurs in a hæmophiliac *Calcium chloride* must be administered. *Phosphorus* and *Lachesis* may also be considered in this connection. Phosphorus is also one of the remedies for the epistaxis of fevers and jaundice. Lachesis is especially indicated in cases occurring at or about the menopause, and for epistaxis occurring before the onset of menstruation.

For the epistaxis of high vascular pressure, *Glonoin* and *Amyl nitrite* should be considered.

*Belladonna* and *Aconite* are the principal remedies for cases associated with cerebral congestion.

For the hæmorrhage attendant upon typhoid fever, *Arnica*, *Bryonia*, and *Hamamelis*.

For the epistaxis of chlorosis, *Ferrum redactum* and *Ferrum phos.* should be considered.

In young persons having recurrent attacks *Bryonia* is a valuable remedy. It should be given several times daily for a considerable length of time. (H. S. Weaver.)

## Chronic Nasal Catarrh.

(*Chronic catarrhal rhinitis.*)

The treatment of chronic nasal catarrh must vary according to the pathological lesions present ; hence, it is convenient to study the case under certain subheadings :

1. **Simple Chronic Catarrhal Rhinitis.**—The treatment of simple chronic catarrhal rhinitis is both general and local, of which the former is unquestionably the most important. The causes at work in its production relate in great measure to disease of some organ other than the nose, to some constitutional defect, or to one or more bad habits. Among the organs, the disease of which is capable of producing the chronic catarrhal rhinitis, the stomach and intestines easily lead the list, while disturbance of the sexual functions is the second. Digestive disorders are also important in their etiological relationship to this disease because of their liability to increase auto-intoxications—these, likewise, being important causes of chronic rhinitis. Of the constitutional diseases capable of acting causatively, neurasthenia, gout, cardio-vascular disease, and some of the acute infections are of the most importance. Of habits, excessive indulgence in alcohol and tobacco are particularly important. The disturbances of sexual functions are almost invariably those that relate to the improper performance or excessive indulgence in the sexual act.

The physician should, in view of the above, never think of treating his cases of chronic catarrhal rhinitis on local indications alone. The patient's eating habits must be studied, and the gastro-intestinal functions maintained in good condition. Special attention must be given to the correction of any constipation. Tobacco and alcohol must be positively forbidden. Coffee may be allowed in moderation, providing it is clear that it does not interfere with the patient's nervous equilibrium. The diet should consist of a proper allowance of the standard foods in quantity suitable for the patient's physical and mental activities. Pastries and sweets should be regarded as harmful, and accordingly must be forbidden. Free water drinking should be advised as a mean of furthering elimination by way of the kidneys. Neurasthenia, gout, and cardio-vascular disease must be treated according to the lines laid down in other sections of this work. The connection between the nose and the sexual organs was well demonstrated by Mackenzie, of Baltimore, a number of years ago, but has not been recognized by physicians, if we are to judge from their neglect of the subject in practice. There can be no doubt that sexual excess, incomplete intercourse, unnatural methods of performing the sexual act, etc., are important causes which must be removed. Among women, it is often noted that there are menstrual disturbances which must be corrected before a cure can be effected.

Hydrotherapy is of great utility, but must be carried out intelligently to be efficient: moreover, it must be prescribed only for suitable subjects. The most efficient hydriatric measure is the cold sponge bath in the morning on rising. Beginning with water of moderate coolness, the temperature should be gradually lowered, morning after morning, until it is taken as it comes from the spigot. The water should be dashed upon the neck

and shoulders with considerable force, and should be followed by brisk friction with a bath towel to secure a reaction. Mere cold bathing, especially in persons of delicate constitutions, under the mistaken notion of forcing them through a "hardening" process, is worse than useless.

Exercise in the open air is highly important for those whose occupations force them to sedentary existence. This may be accomplished by those whose daily duties take up much of their time by instructing them to walk or cycle to and from work, etc.

The selection of clothing of proper weight is important. The usual error of the cases under discussion is that of wrapping up too warmly. As a result, they are unable to withstand exposure, and take fresh colds easily. In keeping with this same fallacy of wearing too heavy clothing, they are not unlikely to live in overheated and illy-ventilated houses. So fearful are they of drafts that every window and door crack is as likely as not to be stuffed with rags, etc., to keep out cool air. Every one of us has had dealings with such patients, and we know with what pride they refer to the ease with which they take cold, and their great sufferings (?) from "catarrh."

While thus impressing upon my reader the importance of the general treatment of chronic catarrhal rhinitis, I would not have him ignore the value of local treatment, which undoubtedly assists to a marked degree. The important local symptom is the free mucous discharge. The treatment of the parts demands that they be thoroughly cleansed before any medicaments are applied. For this purpose there is nothing better than the well-known Dobell's solution, Glyco-thymoline, or Seiler's solution. The cleansing may be done by the douche or the handspray, and should be carried out with the greatest gentleness. It must be borne in mind that the spray is capable of producing a high degree of traumatism of the nasal mucous membrane if it is improperly handled. To avoid such an accident, it is a very good plan always to use the nasal speculum when applying the spray. The latter should be directed against the blade of the speculum at an acute angle, from which it is driven with its force materially lessened to the entire nasal cavities.

When beginning the treatment of some cases with unusually tender mucous membrane, it is a good plan to start the local applications with a weak (1 per cent.) Cocaine solution in spray, after which cleansing as above advocated should be thoroughly carried out. When the turbinated bodies are greatly congested, and their size interferes with the proper removal of the nasal secretions, they may be greatly reduced by the application of a 2 per cent. Cocaine solution on a cotton-covered probe. It is, of course, to be understood that this use of Cocaine should be limited to the first two or three visits, as the secondary action of the drug on the nasal mucous membrane is harmful.

The nasal chambers having been cleansed thoroughly, we are now ready

for local medication. In the beginning, only the mildest astringents should be used. The best for this purpose are sprays of distilled extract of Hamamelis, 1:3, or of fluid extract of Hydrastis, 1:5.

We may also apply the following to the inferior meatus and lower turbinates as far back as the pharyngeal wall:

| | |
|---|---|
| Menthol, | gr. x. |
| Camphor, | gr. x. |
| Albolene vel., | |
| Parolene, | āā ℥j. |

The middle meatus and the upper portions of the nasal cavities are too sensitive for the use of the applicator and should be treated with the spray. The best for this purpose is Douglass's formula, which is as follows:

| | |
|---|---|
| Thymol, | gr. x. |
| Menthol, | gr. xx, |
| Eucalyptol, | gtt. xx. |
| Ol. cubebæ, | gtt. xl. |
| Benzoinol, | fl. ℥vj. |
| Ol. Rosæ, | gtt. x.—M. |

Between visits to the physician's office, the patient should cleanse his nose daily with Dobell's solution, introduced by the Birmingham or Kress and Owen douche. It is not good practice to furnish him with a spray lest he do more harm than good. He may use a nebulizer containing the above formulæ of Douglas, or the following:

| | |
|---|---|
| Ac. boric, | gr. x. |
| Acid carbolic, | m. ij. |
| Menthol, | gr. vj. |
| Camphor, | gr. vj. |
| Oil of tar, | m. ij. |
| Tr. benz. comp., | ℥j. |
| Paroleine, | ℥j.—M. |

The internal medicines useful in this and the other varieties of chronic rhinitis will be considered in another portion of this chapter.

In obstinate cases presenting a high degree of congestion a most excellent remedy is local depletion. This may be secured by light linear scarification of the congested lower turbinateds. It is astonishing to note the permanency of the relief thus occasioned when such treatment is indicated.

## Chronic Hypertrophic Catarrh.

(***Chronic hypertrophic rhinitis; hyperplastic rhinitis; obstructive rhinitis.***)

Practically, hypertrophic rhinitis is the engrafting of a hyperplasia upon an already existing catarrhal rhinitis, the enlargements being distributed unequally over the intranasal structures. The treatment then

must include not only the therapeutic measures already described as invaluable for simple rhinitis, but, in addition, certain procedures designed to get rid of the redundant tissues. Unfortunately, it is too common a practice to proceed to remove these by heroic means before trying those of a simpler character, especially so as there are many cases in which the simpler remedies will suffice. It is even remarkable to note how hygienic and constitutional treatment alone succeeds in some instances. I feel that the above advice should be taken to heart by all readers of this book, for not once, but many times, have patients of mine slipped off to the treatment of some eminent specialist and undergone extensive chemical and electrical cauterization. For a time the results were excellent. Later, with the increase of cicatricial contraction, the local conditions became worse than before. While the day of the indiscriminate use of the cautery has gone, so far as professional leaders are concerned, there nevertheless remains a number of general practitioners who have taken special courses in the past, and who still cherish and practice the old ideas. To them I would give a warning as to unnecessary cauterization of all kinds. It is also important for them to remember that the intranasal hypertrophies are usually "results" and not "primary lesions" or "causes." We may rid the patient of the hypertrophy by mechanical or chemical means, but we have not cured the pathological condition which has existed for many years, and to which their formation is due. Unless we succeed in the latter, we cannot be assured of the permanency of any cure we may bring about.

As in the case of simple rhinitis, we should remember that the nasal mucous membrane is highly sensitive, and should not be subjected to too active local treatment at first. We may begin our first treatment by local anæsthesia with a weak 1 per cent. solution of Cocaine, after which the nasal chambers may be cleansed thoroughly. We may then make applications of the Hamamelis spray or Camphor and Menthol solution on a cotton probe. After a few treatments, we may start in with applications of one of the various Iodine formulæ, which are so commonly used by rhinologists. The following, which is known as *Boulton's solution*, may be sprayed into the nose:

| | |
|---|---|
| Tinc. Iodin. comp., | m. lv. |
| Acid. carbolic, | m. xx. |
| Glycerin, | fl. ʒx. |
| Aquæ, q. s., ad., | fl. ʒviij.—M. |

Place in a warm water bath of 100° F. in a tightly-corked bottle until the solution becomes colorless. Then filter.

The spraying should be thorough, so that it will reach even to the post-nasal space.

If we prefer, we may use Iodo-glycerin applied on a cotton probe. We should always begin with a weaker Iodine solution, increasing its

strength only after tolerance of the irritation has been established, or it is certain that more energetic stimulation is required to effect a cure. Our weak solution should be made according to the following formula :

| | | |
|---|---|---|
| Iodine, | | gr. viij. |
| Potassium iod., | | gr. xvj. |
| Glycerin, | | |
| Aquæ, | āā | fl. ℥ss. |

The stronger preparation should be made as follows :

| | | |
|---|---|---|
| Iodine, | | gr. xij. |
| Potass. iod., | | gr. xxxvj. |
| Aquæ, | | |
| Glycerin, | āā | fl. ℥ss. |

As a general rule, applications of Iodo-glycerin are very irritating and uncomfortable, so in the beginning it is a wise plan to lessen the patient's discomfort by an initial application of a weak Cocaine solution (2 per cent.). The patient should be given to understand that a more or less profuse nasal discharge always follows these applications, but that they will subside in the course of one-quarter to one-half hour.

The above-described line of treatment will bring remarkable improvement in the course of one to two months, according to the severity of the case and the readiness with which the patient yields himself to a hygienic life. If, at the end of that time, hypertrophies still remain, and are sufficiently large to be a source of discomfort, we may consider the advisability of cauterization or increased stimulation. Here, again, we start with the mild measures first.

Anæsthesia should first be secured by applying Cocaine solution (4 per cent.). A minute portion of *Chromic acid* is then fused on the end of a fine probe, and two or three *point* applications should be made over the hypertrophy. One week should be permitted to elapse to note its effect before making a second application. Before applying the acid, the nasal mucous membrane should be cleansed thoroughly. It must also be dried, otherwise the acid will "run" and attack too great a surface.

Another means of using Chromic acid is by the application of a *most minute* portion of the liquefied acid on a very fine delicately-tipped cotton probe. This method is open to the danger of doing too much when used by the inexperienced.

The reader should remember that in the matter of intranasal cauterization *it is better to do much too little than a little too much. The former error can be corrected always ; the latter, never.*

If the results of the above method of applying the Chromic acid are not satisfactory, we may proceed to a more energetic method. The probe is covered with Chromic acid as before. The part to be treated is anæsthe-

tized by Cocaine (4 per cent.). The probe is then carried as far back as possible without touching any of the intranasal surfaces, when it is touched lightly to the hypertrophied turbinated, and a delicate line is drawn along the same to its anterior extremity. Following this, the action of the cauterant should be checked by the application of an alkaline spray. Cleansing sprays (Dobell's solution or Glyco-thymoline) should be repeated daily. All manipulations which might possibly dislodge the eschar prematurely must be avoided.

The galvano-cautery may also be used for reducing the hypertrophy, but demands the exercise of care and discretion. A fine cautery knife should be passed far back, as in the case of the acid-tipped probe. The current is then turned on and the knife heated to a red heat. A light linear application from behind forward is then made over the hypertrophied lower turbinated. The operator should make no pressure. The after-treatment is the same as in the case of Chromic acid cauterization.

Some authorities recommend electrolytic destruction of the hypertrophies. This method has the advantage of being subcutaneous, lessened liability to infection, and retained mucous membrane integrity. It is certainly more painful than the superficial burning, and is slower in its results. It is also probable that a careless operator can do considerable harm with it. The strength of current advised is 10 milliamperes, and the duration of the seance five to ten minutes.

Thus far, all reference to intranasal hypertrophies has pertained to the lower turbinated. Quite frequently the middle turbinateds demand attention, as their disease is ofttimes the cause of such serious symptoms as headaches, asthma, hydrorrhœa, etc. Chromic acid *most carefully and delicately applied with all antecedent precautions* is probably the best remedy in the hands of the general practitioner. The galvano-cautery should never be used, because of its liability to light up an inflammation which can readily extend to important adjacent structures. When the hypertrophy is of large size, the cold-wire snare should be used. It will be the wiser plan, however, for the medical man to refer such cases to the specialist or experienced operator. When the bone itself is involved, *turbinotomy* is required; and this likewise is for the specialist exclusively.

Hypertrophies of the posterior extremity of the lower turbinateds, when sufficiently large to produce obstruction, require the cold-wire snare. (The Jarvis instrument is generally admitted to be the best.) By first cleansing the parts thoroughly, getting a good illumination and view of the field of operation, and exercising some patience, it is possible to enclose the hypertrophy within the wire loop. The snare should be tightened very slowly, from twenty minutes to one-half hour should be taken for the procedure. The after-treatment should include antiseptic cleansing sprays.

**Medicinal Treatment of Chronic Rhinitis.**—*Arsenicum iod., Hydrastis Canadensis, Kali bichromicum, Kali hydriodicum, Pulsatilla* and *Hepar* are by general consent our most efficient remedies in the treatment of chronic rhinitis. *Arsenicum iod.* is indicated in both the simple and hypertrophic varieties, and is largely used empirically when indications for special remedies are wanting. It may be used also in cases presenting naso-pharyngeal and tonsillar disease. The discharge is thick yellow; the patient exhibits a predisposition to catch cold easily; asthma.

*Hydrastis Canadensis.*—Profuseness of discharge, both anteriorly and posteriorly, is an important indication for this remedy. Said discharge is tenacious, sticky, white, or yellow; dull, frontal headache; constipation; scrofulous (?) subjects.

*Kali hydriodicum.*—The nasal discharge is watery, and the rhinitis is complicated by sinus disease or Eustachian catarrh. Nocturnal aggravation of the symptoms. Syphilitic subjects.

*Kali bichromicum.*—The nasal discharge is thick and stringy; or, if fluent, it excoriates the upper lip and alæ nasi; ulceration of the septum nasi.

*Pulsatilla.*—The discharge is thick yellow, or yellowish, green, and bland. It is the leading remedy for the chronic catarrhs following the exanthemata.

*Hepar sulphur.*—Discharge is purulent, stringy, or even bloody; involvement of tonsils and cervical glands; hence, adapted to the "scrofulous" catarrhs of childhood. The patient is very susceptible to colds from slight exposure.

*Penthorum sedoides.*—Continual feeling as if the nose was wet without discharge; naso-pharynx feels raw, denuded; nose and ears feel full. (Ivins.)

Other remedies occasionally useful are *Sanguinaria nitrate, Sticta, Ferrum iod., Allium cepa, Ammonium muriaticum, Calcarea carb., Causticum, Hamamelis, Mercurius iod. rub., Natrum ars., Phosphorus, Sepia, Silicea* and *Theridion.*

## Atrophic Rhinitis.

(***Chronic atrophic catarrh; dry nasal catarrh; fœtid rhinitis; ozœna.***)

The symptoms of atrophic rhinitis depends upon the retention and decomposition of the nasal secretions; and this condition in turn is brought about by atrophic changes in the nasal structures, by reason of which there is defective secretory function and increased capacity of the nasal passages. The indications for treatment include the removal of secretions, treatment of the mucous membrane, and diminution of the patency of the nasal passages.

Many as are the measures recommended for this disease, there is one point upon which all authorities are agreed, namely, the necessity for main-

taining *absolute* cleanliness of the nasal cavities. To do this, most painstaking attention to detail is essential. Time and patience must be exercised, and there must be no hesitation in using sufficient of the cleansing solutions.

For home use, the best cleansing agents are Dobell's and normal salt solution. Objections has been made to the former because of its expense, but as the individual ingredients are all cheap, it can be made up in gallon lots at a very low cost. The salt solution can be prepared for each douching by dissolving one teaspoonful of common salt in one pint of warm water. The Dobell's fluid is the better, as it softens the crusts more readily. The best means of applying the fluid is by the well-known rubber-ball syringe. Its nozzle being made entirely of soft rubber, it is utterly impossible to injure the nasal cavity with it. The fluid should be injected into the nasal cavities with a fair degree of energy; just how much will be gauged by the patient's sensations and the firmness with which the crusts adhere. If the patient does it himself, it is hardly likely that he will exert too much force. After five to ten minutes of this washing the crusts will be sufficiently softened and dislodged to enable the patient to clear his nose thoroughly by blowing. After a week or ten days of such treatments at home, the process of cleansing is carried out much more quickly and thoroughly than at first.

As an alternative to the use of the syringe, the fluid may be introduced by the Birmingham douche, or it may be snuffed into the nose.

The cleansing of the nasal cavities by the physician at his office may be accomplished by the syringe, thus softening the crusts, after which the entire nasal mucous membrane should be thoroughly cleaned of all discharges by the cotton-covered probe. Plenty of time must be taken in order that the work shall be thoroughly done. No fear need be entertained that the long-continued mopping will endanger the integrity of the parts, for it has been demonstrated that the manipulations are beneficial in that they act as a therapeutic stimulant of the atrophied mucous membrane.

Following this thorough cleansing, which should be repeated by the physician every day for the first week, and every two or three days thereafter, the nasal cavities should be thoroughly sprayed with Boulton's solution (*vide* p. 530). After the parts have become accustomed to this stimulation, we may proceed to more active stimulation by swabbing the parts thoroughly with Iodo-glycerin. The results following the treatment thus outlined is to remove all offensive odor very promptly. The mucous membrane becomes hyperæmic, and in this way such of the glandular elements as are not already destroyed take on a healthy activity. It is necessary to keep up the treatment for many months, otherwise relapse takes place. It is doubtful, indeed, if any case of the disease is ever cured to such an extent that the patient himself can abandon the daily cleansing of the parts

at his own home. At the same time, it must be remembered that we never know what we can accomplish until we have tried; and numerous cases after a number of months of persevering, thorough treatment have been brought into a condition of comparative comfort, if not of practical cure.

The inability of the patient to clear his nasal cavities of the contained mucus is generally attributed to their greatly increased capacity, which makes the act of blowing the nose ineffectual. To overcome this in a measure various devices have been suggested. Thus, Gottstein advised and practiced the filling of the inferior meatus with small cotton tampons, which proved beneficial, not only because they reduced the free space in the nasal cavities but acted as healthy stimulants of the mucous membrane.

When the reaction is sluggish, and the secretions remain sluggish, Ivins * used "loosely-rolled pledgets of absorbent cotton saturated with pure glycerin. These acted very promptly by establishing a mucous flow, in loosening the crusts, in modifying the odor, and in giving relief to the annoying subjective symptoms. One side is treated at a time; the pledget need be kept in position but a few minutes, or until a profuse watery flow is established, when all can be readily blown into the handkerchief."

Ichthyol is a very good local application and stimulant. Cotton tampons, well saturated in a 20 per cent. ointment with vaselin and lanolin, should be inserted into the nasal cavities and permitted to remain there for twenty minutes, when they should be removed.

When the odor is difficult to remove, as it may be in the beginning of the treatment, a most excellent remedy is the insufflation of the nasal cavity with a few grains of Potassium permanganate, well triturated with sugar-of-milk or starch in the proportion of 1 : 10.

Formalin is another excellent deodorizer. It has the additional advantage of being a powerful stimulant of the nasal mucous membrane. For use, it should be added to the spray employed for cleansing purposes in the proportion of 1 : 5,000. Later, when the patient becomes accustomed to it, the strength may be increased even to the proportion of 1 : 1,000.

Necessarily, the patient's constitutional state must receive serious consideration, for many cases of atrophic rhinitis occur in syphilitic, tuberculous, gouty, or anæmic subjects. Fresh air, good food, and healthful exercise will do much.

Many freak remedies have been proposed for the treatment of atrophic rhinitis. While valuable in their way, they are impracticable in that patients will not give the time or go to the financial outlay their application requires. Moreover, everything that is obtainable can be secured by the measures I have outlined above.

The principal internal medicines are *Arsenicum iod.*, *Aurum muriati-*

* *Transactions of the Homœopathic Medical Society of Pennsylvania*, 1891.

*cum*, *Kali hydriodicum*, *Mercurius corrosivus*, *Sepia*, *Silicea*, *Alumina*, *Argentum nitricum*, *Hepar*, and *Ferrum iod.*

*Arsenicum iod.* is an excellent empirical remedy. Special indications for its use are profuse, thick, yellow discharge; enlarged tonsils and cervical lymphatic glands.

*Aurum muriaticum* is generally reputed to be indicated in syphilitic cases, thus causing the physician to forget its utility in the ordinary cases of atrophic catarrh. It is unquestionably one of the best—if not actually the best—remedies in pathological states characterized by excessive formation of connective tissues and the glandular atrophies. The characteristic discharge consists of greenish-yellow or bloody and highly offensive plugs or clinkers. Headache; loss of smell; pains relieved by keeping the head warm.

*Kali hydriodicum* is *the* remedy to be given the preference in cases giving the history of hereditary or acquired syphilis.

*Mercurius corrosivus.*—Glue-like discharge, often drying in the naso-pharynx; nasal fossæ raw and smarting.

*Petroleum.*—Scabs and muco-pus; nose and nostrils cracked; muco-pus in the naso-pharynx. Quite a number of authorities recommend the local use of a few drops of crude petroleum instilled into the nasal cavities with a medicine-dropper.

*Sepia* was declared by Ivins* to be an invaluable remedy in atrophic catarrh when there were "yellow or greenish crusts or plugs discharged through the anterior nares, and a gnawing pain or pressure at the bridge of the nose."

*Silicea*, as quoted by Ivins from Boericke and Dewey, is suited to cases of "ozæna when the affection is seated in the submucous connective tissue or periosteum. Painful, chronic dryness of the nose or inveterate ulceration, producing acrid corroding discharge; herpetic eruption around nostrils and lips. Itching at tip of nose." Ivins adds the following symptoms: Secretion purulent, thick or thin, and excoriating to the nose. Throat dry and painful; thick, green, fœtid post-nasal discharge.

*Alumina* is recommended by Quay† for the atrophic catarrh of old people; "hard, yellowish-green discharge, nose swollen and sore, septum ulcerated."

*Argentum nitricum* is indicated more as an intercurrent remedy than for the atrophic catarrh *per se.* Ulceration; discharge bloody and purulent.

## Hay Fever.

(***Autumnal catarrh; pollen catarrh; rag-weed fever; hay asthma.***)

It is with the greatest diffidence that I approach the consideration of this subject. Among my clientele are many persons who are the victims of

* *Diseases of the Nose and Throat*, p. 55. † *Diseases of the Nose and Throat*, p. 55.

this disease. So far as I am aware, all of them have become thoroughly imbued with the idea that the disease is incurable, and that they have but two alternatives, namely, "Grin and bear it," or "Get out." Practically all of them "have been the rounds," and have patiently submitted themselves to the action of various new treatments as fast as "discovered." Rhinologists profess to be able to effect "cures," and yet I must confess it is difficult to find patients who have been cured. Those who have had much to do with this disease may be divided into two classes, optimists and pessimists. The results from any given plan of treatment depends more upon the prognostic temperamental peculiarities of the rhinologists in charge than upon the patients.

Speaking from a strictly personal point of view, most of the hay fever sufferers are individuals of highly neurotic temperament, possessed of a high order of talents in certain directions, making them invaluable as wage-earners. Highly-developed talents in one direction seems to have been gained at the expense of nerve wear and tear. And yet it cannot be said that this statement can be accepted as always authoritative, for I have seen hay fever in a child aged three years, whose heredity was of the best, and who exhibited not a sign of neurotic instability.

Still, general experience will be in accord with me in affirming that the neurotic temperament is an important predisposing cause. It is just this fact that makes these cases so difficult to treat. Whether the cases be recent or of long standing, they are fully up in the literature of hay fever therapeutics. Many of them have tried the whole line of so-called "cures" within the limits of a single summer. Like all neurotics they are notoriously hard to manage. Being mostly persons of affairs, they are too prone to neglect themselves during the interparoxysmal periods, and find time for treatment only when they have become disabled by the disease.

If our ability to cope with this disease is to become any better than it is at present, our efforts must be directed to the removal of the predisposition. At the time of the attacks we can only hope to mitigate symptoms. First, then, I believe we should attack the neurotic constitution. This requires, in a general way, that we correct all bad habits, such as excesses in tobacco, alcohol and sexual indulgence. Irregularities in life that relate to eating, drinking, working, resting and recreation must be discovered and regulated. The possibility of auto-intoxication must be considered, and, when present, should be treated by eliminative measures, as liberal drinking of pure water and increased activity of the bowels, preferably by the administration of Sodium phosphate. Cold sponge bathing or cold spinal douching, followed by brisk friction, should be carried out every morning for the year round. Systematic exercises in the open air, as golf, cycling, tennis, walking, horseback riding should be insisted upon. To those who cannot afford calisthenic luxuries, we would advise the cultivation of hobbies that involve an open-air life.

The second part of the "hay fever problem" consists in the treatment of local lesions, which are said to be present invariably. If such are present they should be treated; but, unfortunately, if I am to judge from results at the hands of eminent rhinologists of New York and Philadelphia, who have treated most of my cases, these must be few and far between, for the trouble recurs year after year. When I have seen them, nasal lesions did not exist. Possessing, as they do, the peculiarities of neurotic subjects, they have not submitted themselves to the rigid measures I have advocated for destroying the predisposition.

Attempts have been made of late years to cure by an immunizing process. One New York rhinologist has proposed (and claims good results from his treatment) that patients be immunized by the daily administration of a fluid extract of the plant the pollen of which produces the disease in his particular case. It is true that his claims are ridiculed, and yet there is enough in his theories to make it well worth careful clinical investigation.

Still later, we have the claims made by Dunbar for his "Pollantin." Dunbar himself is very enthusiastic. Northrop* reports two cases which he believes were cured. I have never tried it, nor do I know of any experiences among my patients. Some professional friends have tried it, and in private conversations have expressed themselves as sceptical, although improvement was noted in a few instances. The treatment does not appeal to me as rational, and yet who knows what it will do after it has been fully developed?

As to the treatment of the attacks, it is important that something be said concerning Cocaine. This drug is capable of giving great relief, and yet its use is not to be countenanced. I doubt even if it should be applied by the practitioner now that we have Adrenalin. In the hands of the laity, it is probably one of the most dangerous drugs ever prescribed. In my own limited experience, two patients, both of brilliant attainments, have become Cocaine fiends. It is to the credit of the profession that they acquired the habit through the use of catarrh snuffs and patent hay fever cures. Even its use by the physician is not without its evils, for while the drug does give great temporary relief, the secondary relaxation following its application causes greater vaso-motor paresis than previously existed.

Fortunately, we have in Adrenalin hydrochloride a drug which is both safe and reliable. I have used it as a spray mixed with Boric acid solution, one part of Adrenalin solution, 1: 1,000, and 4 parts of saturated solution of Boric acid.

The local treatment during the attacks other than the use of Adrenalin consists of the same measures as those advocated in the treatment of acute and chronic catarrhal rhinitis.

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* *Hahnemannian Monthly*, 1905, p 352.

As may well be surmised, but little can be said of internal medication. Artemisia, Allium cepa, Euphrasia, Naphthalin, Rosa damasina, and Sanguinaria, have all had their advocates, and are about equally useless.

Most patients the victims of hay fever find some locality in which they may take refuge during the hay fever season, and remain absolutely free from symptoms. The favorite locality seems to be the country surrounding Bethlehem in the White Mountains. Relief may also be obtained at numerous other mountain and seaside resorts.

### Angioneurotic Œdema.

This rare affection requires about the same line of treatment as is given in cases of hay fever during the attacks. Adrenalin, 1:1,000, is remarkably effective, whether applied as a spray or on the cotton-covered applicator. In severe cases there should be no hesitation in making liberal scarifications of the nasal mucous membranes, the incisions being made in dependent parts so as to secure a maximum of drainage.

The auxiliary and medicinal treatment will be described in the article on Angioneurotic œdema.

### Foreign Bodies in the Nose.

The removal of foreign bodies from the nose of adult patients is not a difficult matter, because the physician is usually consulted before there is an opportunity for inflammatory swelling. In the case of children, who, by the way, constitute the majority of the cases, we have a difficult problem, because of the inability to keep them perfectly quiet. It is then necessary to give a general anæsthetic. In any event, it is a good plan to precede instrumental manipulation by the application of Adrenalin, 1:1,000, to reduce any swelling, and make it easier to get a hook, snare, or wire ring back of the foreign body. Should forceps be used, they should be of the angular rat-tooth variety. The instrument selected will depend very largely upon the fancy of the operator.

It is sometimes possible to remove the foreign body after constriction of the tissue with Adrenalin by simply blowing the nose; or we may take a Politzer bag and endeavor to force it out by blowing through the opposite nostril.

Sajous has recommended, in obstinate cases, that a wire be passed by the side of the body back into the pharynx, when a piece of cotton may be fastened to its extremity. By exerting traction on the wire the foreign body is easily withdrawn.

When maggots invade the nose, thorough and repeated cleaning failing, the best treatment is the injection of equal parts of Chloroform and water. This is painful, and may require the administration of a general anæsthetic. When the insects have started up disease in the accessory sinuses the case should be handled by the specialist only.

### Intranasal Neoplasms.

Intranasal tumors should be removed only by surgical operation. The best instruments for this purpose include the polypus forceps, the Jarvis cold-wire snare, or the alligator forceps with cutting edge. The operation should be performed under Cocaine (4 per cent.) anæsthesia. It is of the highest importance that the operator give himself every opportunity for success by securing first-class illumination of the seat of operation. The parts should be thoroughly cleansed with Dobell's solution, both before and after the removal of the growth. In a few days following the removal, it is a good plan to cauterize the base of the tumor with the galvano-cautery or Chromic acid.

As it is in exceptional instances only that polypi occur in the nose without antecedent disease of the mucous membrane or accessory sinuses it is absolutely necessary that proper treatment be given these etiological factors when present; otherwise, the growths will surely return.

Of the malignant tumors invading the nose, which, by the way, are exceedingly rare, the small round-celled sarcoma is the most common. They offer a very unfavorable prognosis. Operations for their removal are always highly formidable, and should be undertaken only by surgeons or rhinologists of unusual experience and skill.

Weaver regards it a good safe rule to try the *Potassium iodide* treatment in all cases of nasal tumor and await results before resorting to severe operative measures.

### Nasal Syphilis.

Needless to say, the nasal cavities should be watched carefully throughout the management of cases of syphilis. So long as the lesions are superficial, the main features of the treatment include the administration of Mercury or Potassium iodide, as outlined in the chapter on the treatment of Syphilis (*vide* p. 159), the indications for which need not be repeated at the present time. Recovery will be hastened greatly by the adoption of suitable local applications. In the secondary stage the main intranasal lesions are superficial, and the applications should consist of those recommended in chronic catarrhal rhinitis. In all cases the most important item in the local treatment is the preservation of absolute cleanliness. This is secured best by the liberal use of alkaline sprays. When ulcerations appear, they should be cleaned thoroughly with Peroxide of hydrogen on the cotton-covered applicator, after which they may be stimulated by the application of 10 per cent. solutions of Silver nitrate or Protargol. It is a good plan to finish the seance by the application of Iodoform, Aristol, Nosophen, or Europhen.

In the tertiary stage of syphilis, the nasal lesions demand the adminis-

tration of Potassium iodide in large doses.* The treatment must be carried out energetically, as the ulcerations may assume a destructive character before one is aware of it. In these cases, the local treatment is strict cleanliness as directed in the section on the treatment of Atrophic catarrh (*vide* p. 533). Should there be disease of the bones with destructive changes, it will be necessary to remove the sequestra. This latter operation should, whenever possible, be left to the expert rhinologist, not only because he is best fitted for the work, but also as a matter of protection for the general practitioner, who cannot afford to have his reputation in his community tarnished by the presence of a patient with deformed or saddle-backed nose. Following the removal of the dead-bone, he can readily resume charge of the case, instituting cleansing sprays and antiseptic powders, as already indicated. Throughout the course of his treatment he must consider the administration of antisyphilitic medicines as the best means of preventing serious lesions.

In some few cases, *Aurum muriaticum*, *Kali bichromicum*, *Mercurius corrosivus*, *Nitric acid*, or *Asafœtida* may be required to supplement the action of the officinal Mercurials and Potassium iodide.

### Nasal Tuberculosis.

Nasal tuberculosis is practically always engrafted upon a previously existing pulmonary infection. The general treatment is that of tuberculosis in general (*vide* p. 171). Locally, the ulcerative lesions should be treated by the curette, followed by the application of a 25 per cent. to 50 per cent. solution of Lactic acid. The final dressing should consist of Iodoform.

### Affections of the Nasal Septum.

**Hæmatoma and Abscess.**—Hæmatoma of the nasal septum is nearly always of traumatic origin. Its treatment should consist in prompt evacuation of the contents under antiseptic precautions, followed by irrigation of the cavity with some mild antiseptic solution and the application of an intranasal pressure dressing. Prompt opening is necessary, because hæmatomata of the septum are prone to infection and consequent suppuration. The treatment of abscess of the septum is the same as that of hæmatoma, excepting that the cavity should be packed with antiseptic gauze to prevent premature closing of the wound and maintain thorough drainage.

**Ulcerations of the Septum.**—Ulcerations of the septum demand thorough cleansing by alkaline lotions or hydrogen peroxide. After drying the parts, the eroded surfaces should be treated with a ten to twenty grain

* In a few cases, but only a few, I have seen the Potassium iodide in potency do better than the crude. I had one patient who could not take one grain of the crude drug; but the 30th cured promptly. (H. S. Weaver.)

solution of Silver nitrate or Protargol; or we may give the patient the officinal yellow oxide of mercury ointment to apply night and morning.

**Exostoses of the Septum.**—When an exostosis of the nasal septum is discovered, the first question to determine is whether or not it is doing any harm, and, if so, whether it demands removal by surgical means. As long as an exostosis does not interfere with nasal respiration, make pressure upon the turbinated bodies, or excite a nasal reflex it may be regarded as harmless. Even when these prominences do give rise to disturbances, they may be rendered innocent ofttimes by instituting the measures already described as applicable to chronic catarrhal rhinitis.

Should conservative treatment fail, operation is required. Unless the practitioner has had special training, he should leave these cases for the specialist.

**Deflections of the Nasal Septum.**—"Fools rush in where wise men fear to tread" is an old adage, but is singularly applicable to those who indulge in thoughtless operations for septal deflections. How many operations there are for this deformity I know not; but they are legion, and many of them have enjoyed great popularity. The more experienced a rhinologist becomes the more diffident is he in accepting these cases for operation. These remarks are very discouraging as to the outlook of the patient, but I believe they are for his interest. When a septal deformity is sufficiently great to be unsightly or to interfere seriously with nasal functions, it should be referred to an experienced rhinologist for an opinion. The recently devised submucous resection of the septum is now the popular operation, and much is expected of it. It seems to demand a high degree of technical skill. What its future fate will be, time alone will tell.

# CHAPTER XIV.

## DISEASES OF THE LARYNX.

### Acute Catarrhal Laryngitis.

The chill and moderate fever which nearly always usher in an attack of acute laryngitis are clearly-defined indications for two things: first, the placing of the patient in bed, and, secondly, the administration of *Aconite*. The value of rest in bed is not sufficiently appreciated by either patients or physicians, but they may feel assured that recovery will be greatly hastened thereby. The atmosphere of the room should be maintained at a temperature of 65° to 70° F., and kept well moistened by the steam kettle. In the case of adults, some soothing substance, as compound tincture of Benzoin or Hops, should be added to hot (not boiling) water, and the fumes of the drug inhaled. To do this, some home-made inhaler constructed, for example, from a towel may be used. More important than any of the measures thus far advocated is absolute rest of the voice. The patient should be forbidden to talk, even in whispers. The enforcement of this regulation is usually difficult, for aphonic patients are inclined to talk more than they do ordinarily, from a nervous desire to hear their own voices or note improvement or aggravation.

After two or three days of this treatment, we may order inhalations of *Olcum pinus sylvestris*, *Oleum picis liquidæ*, or *Oleum eucalyptus*.

Acute laryngitis is to be regarded as a serious disease with persons who make much use of the voice, for the slightest unusual exertion is apt to retard recovery. Because of this, it is a wise plan for patients to observe unusual precautions for several weeks after leaving the house, especially in respect to exposure to the night air, sojourning in super-heated illy-ventilated rooms and improper clothing. The external application of cold by small rubber ice-bags or the Leiter coil is invaluable during the acute inflammatory stage of the disease.

This is probably as suitable a place as any to refer to the not infrequent request made of all of us from time to time by singers and public speakers for a "vocal pick-me-up" to tide them over an effort to be made the same evening. As a matter of common sense, such requests should be refused and the patient ordered to take the needed rest, instead of risking the integrity of his laryngeal function permanently. As such "pick-me-ups" must be prescribed, we should take control ourselves; otherwise, the patients will resort to some proprietary lozenges to their ultimate

harm. Wine of Coca, which may be prepared by adding a fluid extract of Coca to sherry or Bordeaux wine, is very good for this purpose, but the patient must not be permitted to indulge in it regularly. A hypodermic injection of one-sixtieth of a grain of Strychnia is another good tonic for the voice. It is the one I prefer. Lennox Browne* recommends the administration of five minims of Laudanum with twenty minims of Ether about ten minutes before the vocal effort is to be made. But he is very positive in his instructions that such medication shall be practiced on very rare occasions only. Disregard of this injunction will surely result in early and permanent impairment of the voice.

A solution of Zinc chloride of the strength of five to fifteen grains to the ounce sprayed into the larynx will allay the congestion and clear the voice; or a local application of the same substance in ten grain solution in glycerin by the swab or brush will aid very materially (Weaver).

*Aconite* is indicated in the beginning of the majority of cases by reason of the fever and chilly sensations. It is also to be considered as an invaluable remedy for acute laryngitis due to "straining" the voice. Later, it may be indicated by the dry cough, aphonia, scanty, thin, or frothy expectoration, and pain in larynx.

*Ferrum phosphoricum.*—This is also a useful remedy for the febrile stage. It should be prescribed when the fever lacks the restlessness and dry skin of Aconite. Ivins looks upon it as the remedy adapted to the majority of cases, and often the only one that will be required throughout the illness. He quotes, approvingly, Houghton,† who says: "It enables singers to control the voice in its entire compass by holding a disc in the mouth for a few minutes previous to any unusual effort."

*Belladonna* should be administered when the local inflammation is of a high grade, and the patient exhibits high fever with moist skin. Locally, the parts are bright red, and even œdematous. The patient complains of a dry cough, sense of constriction and dryness in the larynx. The use of the voice is painful.

*Phosphorus* is indicated by the high degree of aphonia, and association with tracheitis. The larynx feels rough and wooly; or there may be a sensation of rawness with sensitiveness to pressure. The cough is at first dry and hacking. Talking aggravates the cough, the aphonia, and the various morbid sensations.

*Guaiacum* is recommended by Ivins on the authority of Thomas and King, "when in laryngitis and laryngeal irritation without other indications the bands are boggy, there is loss of tone and lustre." They prescribe the tincture of Guaiacum internally, and the ammoniated tincture in the proportion of one drachm to the ounce of water as a spray.

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* *The Throat and Nose and Their Diseases*, p. 455.

† *Transactions of the Homœopathic Medical Society of New York*, 1886.

*Hepar* and *Kali bichromicum* are the most efficient remedies for the acute laryngitis or catarrhal croup of children.

*Wyethia* is a good remedy for acute conditions arising from over-use of the voice.

Additional remedies for consideration are *Bromine*, *Iodine*, *Spongia*, *Causticum*, and *Sanguinaria*.

### Chronic Catarrhal Laryngitis.

Chronic catarrhal laryngitis is very rare, especially so as an uncomplicated affection. Resulting, as it may, from frequent recurrence of the acute inflammation, or as a sequel or concomitant of lesions of the nose and pharynx, we have in these etiological factors very important suggestions as to the treatment. Many cases occur among singers, public speakers and others who use their voices excessively or improperly. Additional causes include excessive indulgence in tobacco and alcohol, exposure to chemical and mechanical irritants in the atmosphere, and the gouty and rheumatic diathesis, syphilis, and tuberculosis.

The general treatment of the disease demands attention to these various etiological factors. The cause removed, recovery should take place without further attention. Unfortunately, we are ofttimes obliged to assist nature, and this may be done by local measures and internal medication.

The local treatment should be of the simplest possible character at first. To be recommended especially are sprays of alkaline solutions, Listerine, Glyco-thymoline, etc. If these fail, we are obliged to resort to astringent sprays, of which Alum or Zinc chloride in the strength of ten grains to the ounce of water is the best. The spraying will be more efficiently done if the operator make use of the laryngoscopic mirror, so as to direct the medicament more surely to the diseased parts.

If these fail, then we must make direct applications with the cotton-covered probe. We should then use *Ichthyol*, in strength ranging from 20 to 50 per cent., or *Silver nitrate* or *Protargol*, ten to twenty grains to the ounce.

The leading remedy for chronic catarrhal laryngitis is *Causticum*. Paretic conditions, which commonly exist in the disease, constitute the important indication. Slight over-exertion produces loss of voice; attempts at sounding a high note end in a squeak. The laryngeal mucous membrane is dry and glazed. Hoarseness of singers worse in the morning, and in dry cold weather. Difficult expectoration.

*Ammonium muriaticum* is used considerably by old-school physicians. Quay gives the following indications: "Hoarseness with burning in the larynx afternoon. Frequent hawking with expectoration of small lumps of mucus and sensation of rawness in the throat." This drug is remarkably efficient in liquefying thickened mucous secretions, hence aiding their expectoration.

*Hepar sulphur.*—This remedy is adapted to cases occurring in persons of so-called tuberculous predisposition, and who take cold easily. Hoarseness is marked, and is associated with rough, barking cough. The expectoration is tenacious and of a muco-purulent character, and is brought up with difficulty.

*Kali bichromicum* is indicated when the mucous membrane is of a dark-red color. Ivins specifies the following local signs as special indications: "Varicose veins in the larynx; vocal bands and posterior laryngeal wall puffy; larynx feels dry." He furthermore quotes Meyerhoff as authority for the following: "The aryepiglottic ligaments, the ventricular bands, and lining of the posterior part of the larynx, dark red, puffy, and partly covered with a grayish mucus; the vocal cords slightly injected; and some varicose veins in the pharynx." The expectoration is ropy and stringy.

*Phosphorus.*—Aphonia worse in the evening; hoarse cough; voice tires easily; vocal bands highly injected, or of a dirty yellow color. Larynx sensitive and dry. Dry, spasmodic cough with tickling in the larynx.

*Argentum nitricum.*—Discharge of muco-purulent sputum, with ulceration of the larynx.

Additional remedies to be considered are *Ammonium causticum*, *Argentum metallicum*, *Antimonium crudum*, *Calcarea carb.*, *Sulphur*, *Senega*, *Stannum*, *Gelsemium*, *Lachesis*, *Rhus tox.*, *Rumex crispus*, and *Sanguinaria.*

## Œdematous Laryngitis.

Œdematous laryngitis, or, as it is more commonly known, œdema of the glottis, is nearly always a secondary disease, being either the product of traumatism or of some violent local inflammation, or a complication of chronic nephritis, anæmia, or disease of the heart and lungs. The dyspnœa which it produces is usually very severe, and if not relieved promptly may lead to fatal asphyxia.

Locally, the application of a spray of Adrenalin, 1:1,000, often exerts very prompt action in reducing the swelling. It has also been recommended that five grains of the powdered Suprarenal extract be permitted to dissolve on the tongue, after which it is swallowed.

If this fails, we must make multiple scarification of the œdematous tissues, which nearly always brings prompt relief.

All these measures failing, we must resort to tracheotomy.

The recommendation of *Pilocarpine* hypodermically in doses of one-sixth of a grain does not impress me favorably from a practical standpoint, however fascinating it may be in theory. The profuse bronchial secretion excited by it would make me feel very uneasy when using it. Still, the drug has the sanction of numerous high authorities.

Internally, *Apis*, *Arsenicum*, *Kali hyd.*, *Bromine*, *Iodine*, *Sanguinaria*, *Belladonna*, *Digitalis*, *Mercurius corrosivus*, and *Crotalus* have been recommended.

### Laryngeal Tuberculosis.

The multiformity of the pathological changes, together with the various stages which they may have reached at the time the cases may come under professional supervision, make it plainly manifest that cases of laryngeal tuberculosis cannot be treated according to routine methods or by any specific medication. So far as hygienic rules are concerned, we have our course of action very plainly defined. The common association of tuberculosis of the larynx with identical changes in the lungs teaches us plainly that patients with this disease must undergo, as part of their treatment, the course already outlined as applicable to pulmonary tuberculosis (*vide* p. 171). This, as already stated, includes a life in the open air and judiciously supervised rest, exercise, and good feeding. The propriety of a change of climate, which is urged by many authorities, may well be questioned, for an important part of the treatment of the majority of cases is skilled local treatment. The patient must then be kept within localities where he can obtain skilled medical attendance. If such places have a dry atmosphere and a high altitude, so much the better; but it must be remembered that personal comforts and medical supervision are the first desiderata.

All are now agreed that rigidly enforced laryngeal rest is an important —indeed, a necessary—therapeutic agent. It stands to reason that a highly inflamed organ cannot be expected to recover if it is permitted to be in more or less active function. The ideal treatment is, of course, the absolute prohibition of use of the voice, or, as it has been called in England, "The silence treatment."

This treatment of laryngeal tuberculosis has recently been strongly advocated by Sir Felix Semon,* and the results to be obtained by a long period of rigid silence are illustrated by him in the report of seven cases thus treated. Complete vocal rest as a therapeutic measure is not new with Semon, he himself giving credit to Moritz Schmidt, who, in 1887, advocated tracheotomy for the purpose of securing complete rest of the larynx. Schmidt, however, made a distinction between "quiescence of the larynx" and "mere vocal rest." Semon quotes him as follows:

"As a matter of fact, it is extraordinary that after tracheotomy the tuberculous diseases often disappears without further treatment. Very likely one has to regard in the very first place the quiescence of the larynx as the effective element, and in addition the prevention of dust and bacterial infection. Mere quiescence without tracheotomy I have often obtained in the case of reasonable patients who did not speak a syllable for months. Complete silence alone is not so surely effective as tracheotomy."

* *British Medical Journal*, December 8, 1906.

Long before Semon published the article from which I quote, he had been strongly impressed with the importance of resting the larynx, but knowing the almost insuperable obstacles to be encountered in securing absolute silence for many weeks, perhaps months, he had rested satisfied with instructing patients to "spare their vocal cords as much as possible." With the advent of the sanitorium treatment of tuberculosis, and its popularity with the laity, it became possible to place these patients amidst surroundings and under supervision which made complete vocal rest possible. Even with these advantages, it is not an easy matter to enforce the silence treatment. If patients were let alone by injudicious friends and thus kept free from temptation, success would not be so very difficult. Patients will, if given to understand the favorable results to be secured, willingly give aid to physicians and care-takers. The "silence treatment" while not a panacea is nevertheless of such inestimable value as to warrant the physician's enforcing the same upon his patients with laryngeal tuberculosis, with a certainty that it will prove of great therapeutic value excepting when the lesions have advanced so far to extensive disintegration of the laryngeal structures.

The use of the voice then increases the local irritation; and this in turn means increased frequency of coughing; and coughing excites traumatism of the larynx. So we have an additional reason for enforcing the silence treatment whenever possible.

The local treatment of laryngeal tuberculosis demands very nice judgment—indeed, I might say experienced judgment. I have often been impressed in the past with the diversity of opinions among laryngologists of world-wide reputation as to whether certain lesions were tuberculous or otherwise. This being the case, it is readily conceivable that opinions may conflict as to the proper treatment of lesions which are acknowledged to be tuberculous or pre-tuberculous. In cases of doubt, the course of treatment which cannot do harm though it fail to benefit must be selected. When the propriety of local treatment is questionable it should be abandoned until the indications for it become clear.

It is a good working rule to enforce the general measures already advocated for the treatment of chronic catarrhal laryngitis, namely, the thorough cleansing of the larynx. In tuberculous laryngitis it is important that the clearing away of all secretions be done with unusual thoroughness; indeed, the patient should be seen by the physician at least every day. If he is in a sanitorium for the tuberculous and a physician is handy, it will be better if the cleansing be done twice daily. The best cleansing media are the ordinary alkaline solutions and peroxide of hydrogen. The latter should always be applied on a cotton-covered applicator to the *locus mali*.

As to the treatment of the strictly tubercular lesions, there is a general

consensus of opinion among those best qualified to judge that *Lactic acid*, crude or in 50 per cent. solution, is decidedly the most efficient. Of course, it is painful, but this difficulty can be overcome readily by previous applications of Cocaine solution. Each seance should be completed by the application of *Iodoform* to the lesions.

Heryng proposed a number of years ago the thorough curettement of all tubercular foci. Notwithstanding the enthusiasm of the originator, and the adoption of the treatment by a number of laryngologists, this measure cannot be regarded as authoritative. Indeed, there are some excellent men who condemn it.

Tracheotomy is undoubtedly of considerable value, but it acts by giving the larynx rest. The same result can be secured by the silence treatment.

After all is said concerning the local treatment of laryngeal tuberculosis, we are obliged to admit that the most important factor in the treatment of the disease is that which recognizes the co-existence of pulmonary disease. We cannot hope to reach the local troubles without attention to the patient's general condition. Measures which improve the condition of the lungs relieve the laryngeal lesions.

The medicines useful for laryngeal tuberculosis are those already mentioned for the pulmonary disorder (*vide* p. 171). Those to be mentioned as having particular value are *Ferrum phos.*, *Phosphorus*, *Stannum*, and the various preparations of *Iodine*.

Laryngeal tuberculosis should be regarded as a condition in which the physician should always have associated with him the services of an expert laryngologist.

## Laryngeal Tumors.

All cases of laryngeal tumors, whether malignant or benign, should be turned over to skilled operating laryngologists. The removal of tumors from the vocal cords or larynx by way of the mouth and throat demands a steady hand, skilful use of the throat-mirror, and experience. No medical practitioner or general surgeon should think of attempting their removal. No doubt he will succeed in getting the growth away, but he will not do it to the best interests of the patient, for he will, in all likelihood, take away too much or too little.

Some tumors, indeed many of them, can only be removed after a preliminary tracheotomy.

It is unwise to waste time attempting to cure with medicines, unless the growth is clearly syphilitic. Sudden laryngeal obstruction with fatal cyanosis may take place.

### Laryngeal Syphilis.

Syphilis of the larynx demands energetic antisyphilitic measures, medication being continued until it is certain that recovery is complete. When necrosis of cartilages supervenes, surgical intervention is needed. I have seen two instances of laryngeal syphilis in which treatment had been neglected, or, rather, improperly carried out. Patients had dallied with Mercury and Potassium iodide, and after relapsing had neglected these remedies altogether. There finally developed in both a practically complete stenosis of the larynx demanding tracheotomy.

Cicatricial deformities from the ulcerations will be greatly lessened if local treatment be given. The best is the application of *Silver nitrate* or *Protargol*, followed by insufflation of Iodoform.

# CHAPTER XV.

## DISEASES OF THE BRONCHI, LUNGS AND PLEURA.

### Acute Bronchitis.

Persons who are subjects to attacks of acute bronchitis can do much in the way of preventing recurrence by a judicious hardening process. An investigation into the histories of the regular victims of this affection demonstrates that they have been brought up, ofttimes from early childhood, as "hot-house plants." As a result, the slightest unexpected change in weather or a simple exposure to a mild draft of air provokes an illness. The prophylactic measures for the bronchitic subject include the cold sponge bath in the morning on rising, followed always by a brisk friction to awaken a reaction, a supply of unvitiated air, and the regulation of clothing according to existing conditions. The value of the first-named of this trio is incontestable, as is also the second. The invalid too often loves his ease too much to take the time and trouble to take his morning sponge; he is too fearful of drafts to maintain a sufficient supply of pure air; and he is so morbid as to "catching cold" that he is only too apt to be chronically over-burdened with clothing, even to the extent of perpetual perspiration. In those cases in which an underlying diathetic condition exists, as gout and tuberculosis, attention to these is the important prophylactic measure.

As bronchitis is rarely dangerous excepting in infants and the aged—if we except the victims of organic heart disease, nephritis, and alcoholism—it is, therefore, incumbent upon us to look after these subjects as much as we possibly can. Infants thrive on the daily cold sponge and a maximum of fresh air and proper clothing. With the aged and the victims of the underlying chronic diseases to which reference has been made above, we must, as a rule, omit the cold sponging and rely exclusively upon the daily "airing" and the regulation of the weight of clothing according to the weather and surroundings.

The general management of acute bronchitis demands but simple measures. In the mild cases, unattended by fever, the patient may go about his usual duties, relying exclusively upon internal medication, providing he adopts ordinary precautions as to unnecessary exposure. All febrile cases should be confined to their beds for two or three days after the fever has subsided; and should remain in the house for two or three days more.

The atmosphere of the room must be pure, and the air maintained at a temperature of 65° F. to 70° F. It must be kept moist. If tuberculosis is the underlying condition, the windows must be kept wide open, and the patient properly covered and protected from direct drafts. A dry atmosphere is irritating to the inflamed bronchial mucous membrane. To avoid this, water may be kept boiling in the room. In some cases direct inhalations of steam are found very soothing. Some physicians advise that the steam be medicated, using for this purpose *Eucalyptus*, *Thymol*, *or* the compound tincture of *Benzoin.* Personally, I have never found medicated steam necessary.

An early sweating is often sufficient to greatly modify the subsequent course of an acute bronchitis. The measures employed for this purpose include the hot bath, the hot mustard foot-bath, and the hot wet-pack. The patient should be kept in the latter for one hour and a half to two hours, after which he should be thoroughly dried with brisk friction and put to bed This latter agency is a doubtful expedient in the aged because of the condition of the heart and arteries in this class of subjects. If it is employed, special attention must be paid to the circulation.

A hot whisky punch is very efficient, and is a wise prescription excepting in persons who have an abnormal craving for alcoholics.

Local applications to the chest are unnecessary excepting when there is considerable shortness of breath or respiratory distress or annoying soreness of the chest. Under these circumstances we may resort to hot flaxseed poultices, the clay-glycerin pastes, of which antiphlogistin is the type, or hot compresses covered with a woolen cloth.

In the febrile cases the diet must be liquid. In the milder ones it is only necessary to limit the quantity of food taken because of the patient's physical inactivity.

The remedies which are indicated in the earliest stage of an acute bronchial catarrh include *Aconite*, *Ferrum phos.*, and *Bryonia.* *Aconite* is indicated by the etiological factor, exposure to dry cold atmosphere. The fever is well defined, and is associated with or preceded by feelings of chilliness, and is associated with a high degree of restlessness. In the majority of instances, the local manifestations of the bronchitis are merely foreshadowed by vague sensations in the chest, showing that it is about to bear the brunt of the illness.

*Ferrum phos.* presents indications similar to those calling for Aconite, but lacks the irritability and restlessness of that remedy. Chest symptoms are better defined. Cough is present, and what little expectoration there is, is commonly stained with fine streaks of blood.

*Veratrum viride* is indicated in cases which start in with high temperature with full, hard, rapid pulse. It lacks the restlessness and anxiety of Aconite.

*Bryonia alba* is indicated by a dry cough, which causes more or less pain, forcing the patient at times to hold the chest to prevent the pain and discomfort arising from the jarring. A very characteristic accompaniment of the Bryonia case is myalgic pains in the chest aggravated on attempting to take a deep breath or by any motion.

Dewey * further says of this remedy: "There is great pressure over the sternum, dyspnoea, and a dry cough, which seems to start from the stomach. It is worse after a meal, and there is but little expectoration. The cough is more the result of an irritation in the larger bronchi than in the finer tubes, and the hacking produces sore spots in the trachea and chest." . . . "The cough is aggravated by coming into a warm room from the cold air."

*Rumex crispus* enjoys an excellent reputation in the treatment of those cases in which the cough is dry and harassing. There exists marked hyperæsthesia of the mucous membrane of the trachea and larynx, so that any change in the temperature of the respired air or attempts at speaking excite coughing spells. My success with this remedy has been disappointing. Indeed, I might say that no remedy has been of avail excepting those of palliative character. For many years, *Codeine* was the drug in common use for bringing relief. Since *Heroin* has come into use, I have prescribed it as a means of relief and with great satisfaction. It is best given in doses ranging from $\frac{1}{20}$ to $\frac{1}{12}$ of a grain, not oftener than once in four hours. It has seemed to me, however, that cases treated with Heroin do not recover as promptly as those treated without it. Nevertheless, I am bound to recommend it, for the sleepless nights occasioned by the paroxysms of coughing renewed every minute or two demand relief. Of the two evils attendant upon such cases, one is constrained to choose the lesser. If Codeine is selected, it should be prescribed in doses of one-half grain not oftener than every four hours. Neither Codeine or Heroin should be used for the palliation of an effective cough, *i.e.*, one which is attended by the raising of sputum. A cough of this character is a good thing, and is to be encouraged. The inefficiency of remedies for dry cough is attested by the number suggested for its cure, including *Hyoscyamus, Sticta, Scilla, Belladonna*, and *Lachesis*.

Of these, *Belladonna* is deserving of the most confidence. It is indicated when the fever is high; the patient complains of a dry, continuous, distressing cough; the breathing is hurried and irregular; if expectoration is present, it is not infrequently blood-streaked; sensation of fulness in the chest without any pain. The fever of Belladonna differs from that of Aconite and Veratrum viride in that the skin is moist.

When an acute bronchitis has reached the stage of free exudation, the

* *Practical Homœopathic Therapeutics*, 36.

principal remedies which are most efficient are *Phosphorus*, *Apomorphia*, *Terpin hydrate*, *Kali bichromicum*, *Antimonium tartaricum*, *Antimonium iod.*, *Antimonium ars.*, and *Ipecacuanha.*

*Phosphorus* is indicated in those cases in which there is a free expectoration of a sweetish mucus, and there is an attendant oppression experienced beneath the upper portion of the sternum. In some cases this may amount to a tearing pain. Not infrequently the bronchitis is associated with laryngeal catarrh, as evidenced by well-defined aphonia.

The character of the patient is an important factor in the administration of Phosphorus, this drug being especially indicated in tall, slender subjects who have frequent recurrences of bronchitis. There are present mucous râles, bloody mucous or purulent sputum, having a salty or sweetish taste; the patient is better after sleep; respiration is embarrassed.

*Apomorphia* is a most efficient remedy in all respiratory diseases attended by loose cough. It is sometimes a great help in hastening the moist stage of a bronchitis. It should be given in doses ranging from $\frac{1}{20}$ to $\frac{1}{100}$ of a grain, not oftener than once in two hours. In infants, the dose should be much smaller than the latter. There need be no fear of producing nausea in these doses. Under no circumstances should the drug be prescribed in solution, as it rapidly decomposes, and thereby not only loses its efficiency but has its composition so altered that it may produce some very undesirable symptoms. The solution is good as long as it remains clear, but usually within four hours it will be found to have changed to a bright green.

*Terpin hydrate* has lately come into vogue as a bronchitic remedy. It is used for the purpose of changing a dry into a moist cough. It is not infrequently combined with Heroin in various proportions. While Terpin is a satisfactory medicine, I am not satisfied that it is any more efficient than Apomorphia. The combination with Heroin is open to the same objection as Heroin alone—the prolongation of the illness. Still, it must be confessed that patients express themselves as pleased with it. The dose of Terpin hydrate is three to five grains, and it may be repeated every two hours. It is best administered in tablet form.

*Ipecacuanha* is indicated when the cough is attended by expectoration of mucus and is associated with vomiting and nausea. The râles are loud and coarse. It is especially suited to the capillary bronchitis of infants and children.

*Antimonium tartaricum* is an important remedy in the capillary bronchitis of infants and children. It is indicated by the presence of numerous sub-crepitant râles throughout the chest, wheezing breathing, the cough has a loose sound, but does not succeed in bringing up any mucus. By reason of this ineffectiveness of the cough, the child becomes more or less

drowsy, and respirations become shallow. Suffocation is threatened by the retention of secretions.

"*Mercurius.**—The sovereign remedy in inflammatory bronchial catarrh; there is roughness and soreness from the fauces down through the middle of the chest, a dry concussive cough which is very exhausting; sputum watery, saliva-like, or yellow and muco-purulent. There is fever alternating with chills and heat, desire for cold drinks, which aggravate the cough, and pasty sweat without relief."

*Kali bichromicum* is adapted to cases in which the bronchitis is associated with well-defined symptoms showing laryngeal and tracheal involvement, as well as in uncomplicated bronchitis. In the former case, we have the characteristic croupy cough. The bronchitic expectoration is yellow in color, and quite stringy. Wheezing sounds are audible over the chest. The cough is of a spasmodic quality. For bronchitis associated with laryngitis and tracheitis, we should also bear in mind, as possible remedies, *Spongia*, *Hepar*, *Iodine*, and *Bromine*.

*Baryta carb.* is useful in the acute bronchitis of the aged, when there is great accumulation of mucus within the chest, and the cough is inefficient in raising it.

*Carbo veg.* is also adapted to the bronchitis of the aged, being indicated by a profuse yellow fœtid expectoration, with dyspnœa, much rattling in the chest, and burning sensation.

For the attacks of bronchitis occurring during the course of pulmonary tuberculosis, the remedies are *Stannum met.*, *Stannum iod.*, *Antimonium iod.*, and *Antimonium ars.*

## Chronic Bronchitis.

In the treatment of chronic bronchitis one has before him a very complex problem. The obtrusive condition he is called upon to relieve is the cough with the expectoration. In the majority of individuals such a state of affairs exhibits a natural tendency to recover without treatment. For it to persist sufficiently long to make the application "chronic" permissible, surely indicates either an underlying dyscrasia, peculiar anatomical conditions, or a chronically acting cause. Hence, etiological factors must always be considered in outlining one's plan of treatment. Occurring in the course of tuberculosis, the systematic treatment by air, rest, and feeding must be followed. In the aged, special constitutional and local measures that may exist demand attention, most of the constitutional measures belonging to the class known as reconstructive. If the patient is gouty or rheumatic, or the victim of heart or renal disease, emphysema or syphilis, the therapeutics of the case must be regulated accordingly. If he is addicted to alcohol, or exposed to an atmosphere full of dust or chemical fumes, he must be removed from the deleterious influences which surround him.

* Dewey, *op. cit.*, p. 37.

As the vast majority of cases of chronic bronchitis are aggravated during the winter months and by unfavorable changes in the weather, climatic treatment becomes of the first importance. It is usually advised that the patients be made to spend the winter months at a specially selected health resort. This advice does very well for those financially able to take it. Others, whose general condition is still sufficiently good to permit them to work under favorable influences, may make a permanent change in their homes. The localities which are now regarded as especially advantageous for the bronchitic invalid are those which permit him to remain out-of-doors for a maximum period. Hence, it is the custom to advise him to resort during the winter months to Florida and Southern California. Other localities, as Arizona, offering like advantages, may also be selected. After all, it is now being recognized that it is not so much questions of altitude, and dryness and moisture, as it is those of freedom from dust and impurities, and advantages of the out-of-door life that we desire to obtain. Inflammatory affections of mucous membranes demand, as part of the processes designed for their cure, agencies which promote cleanliness of the diseased parts. In the case of the nose and throat, local applications may be made to bring about the desired result. But such are inadmissible in the case of inflamed bronchial mucous membrane. We are obliged to fall back on the greatest remedy for pulmonary structures, namely, oxygen, and this in abundance; and this remedy cannot be supplied in any better way than by a constant life in the open air. The value of this treatment is recognized in the case of pulmonary tuberculosis. In chronic bronchitis, it must be persisted in for even a longer time; and it has even been asserted that two years of the treatment should be allotted for the most obstinate cases of chronic bronchitis.

The habits of the patients as to indulgence in alcohol and tobacco must be inquired into. Practically, all patients are better off with these substances eliminated from their daily life. Alcohol acts adversely in chronic bronchitis by reason of its influence in producing cardio-vascular degeneration, gastro-intestinal catarrh, and disease of the liver and kidneys. Occasionally, in persons who have been addicted to its use, its administration in small quantities at infrequent intervals is advantageous. This applies especially to aged subjects.

Attention has been directed above to the relationship existing between chronic bronchitis and organic heart disease, the latter having been emphasized as a causative factor in many instances. On the other hand, it must be remembered that cases associated with impaired heart must be carefully studied, lest the relationship between cause and effect be not properly appreciated, for it is possible for the defective aëration attendant upon the bronchial disease and the more or less constant repetition of coughing, may make what might have been an insignificant cardiac lesion a very

serious one. It therefore behooves the physician in any case to maintain an ever watchful eye on the condition of the heart. When evidences of cardiac incompetency appear they should be treated according to the principles laid down in the chapter on cardiac therapeutics.

The clothing of the patient is of the highest importance. Excepting in the warm months of the year, he should wear flannel garments. Their weight should be regulated according to the exigencies of the weather. Under no circumstances should they be sufficiently heavy to keep the body bathed in a profuse perspiration; and they should protect the body from undue loss of heat.

The diet should be a well-selected mixed one. No special directions are required other than those entailed in practicing good gastric hygiene. The patient must be as well nourished as his circumstances and the state of his digestion will permit.

How far antiseptic inhalations may prove useful in the treatment of chronic bronchitis is impossible to say. The trend of opinion is against their use. The internal administration of *Creosote carbonate* (*Creosotal*) has been highly recommended by numerous old-school authorities, the special claim for its selection lying in the fact that it is not apt to disagree with the stomach—a very important desideratum. It may be prescribed in doses of five drops and upwards every three hours. It can be administered "straight" or in an emulsion made with glycerin. *Carbolic acid* is much vaunted by Wm. H. Thomson, of New York. The dose advocated by him is twelve grains of the pure acid in the course of the day. It may be administered in the form of pills; or a solution of twelve grains of carbolic acid, half an ounce of glycerin, and a pint of water may be made and portions of it taken as a drink from time to time during the day.

Thomson is also a warm advocate of emulsion of linseed oil as a means of making the sputum less tenacious and cough less violent. His formulæ is as follows: "Irish moss, ℥j., boil in water for one hour and strain, making Oiij; then add ol. lini f℥xv., ol. gaultheriæ, ol. cassiæ, āā ℥ij., glycerini, ℥v., syr. simpl. ℥x., acid hydrocyanici dil., m. clx. The dose of this is one tablespoonful taken an hour after meals."*

The list of remedies of positive use in the treatment of chronic bronchitis is a very large one. Indeed, any drug having any clinical relationship to cough and expectoration or to diathetic conditions may prove curative in suitable cases. While I have limited the symptomatic indications in the main to cough and expectoration and to constitutional states, I do not mean to convey the idea that in the treatment of a disease of the character of bronchitis that it is upon these we must place our entire reliance. Oftentimes, too, our prescription must be directed to symptoms having relation-

* *Reference Handbook of the Medical Sciences*, vol. ii, p. 491.

ship to organs other than those constituting the respiratory apparatus, especially to the heart and kidneys.

Of the remedies that have been recommended in chronic bronchitis, Iodine and the Iodides stand in the highest favor. *Iodine* itself is indicacated in cases having tuberculosis as their basis. The patient is emaciated; the cough is mostly dry; there is occasional blood-spitting. *Iodide of Antimony* was introduced into our materia medica by Goodno* as a remedy for chronic bronchitis and respiratory diseases generally. His indications are: "Spasmodic cough, aggravated especially in the morning and often at night, and attended by a free expectoration of muco-purulent matter of an indifferent or sweetish taste, attended by rapid loss of flesh and strength, and by night sweats." "One grain tablets of the second decimal trituration, frequently repeated, is the best form of administration." Hale† gives additional indications: Bronchitis occurring as an extension from catarrh of the upper air-passages; bronchorrhœa; coarse râles and bubbling heard all over the chest.

*Arsenicum iod.* has been a favorite remedy in chronic bronchitis for many years. Its indicating symptoms are mostly constitutional, and include anæmia, prostration, and rapid loss of flesh. It is especially adapted to cases occurring in the aged, and those associated with heart and kidney disease, and as a complication of the early stage of pulmonary tuberculosis. Very often there is a rapid, irritable pulse, recurring fever and sweat, and tendency to diarrhœa.

*Kali hydriodicum* is likewise an old remedy. It is most likely to give its best results in cases associated with asthmatic paroxysms, and in syphilitic subjects. The asthmatic cases yield to comparatively small doses, *i. e.*, ten or fifteen grains daily. The syphilitic cases may require that the drug be pushed to the physiological limit.

*Stannum iod.* is another of Goodno's‡ remedies. "Expectoration is copious, easy, and of dense muco-purulent character." The author seems to have transferred the indications of Stannum to that of the Iodide, and expresses his firm belief in the greater efficiency of the latter. He uses it almost entirely in the second decimal trituration.

*Lithium iod.* is rarely used, but may prove efficient in chronic bronchitis of gouty origin.

*Antimonium tartaricum* is useful in the chronic bronchitis of the aged, for acute exacerbations occurring in the course of chronic cases generally, and those associated with emphysema. There is an abundant accumulation of mucus within the chest, but the expulsive power of cough is feeble. Cyanosis may be present; the patient may exhibit dyspnœa, forcing him to maintain the sitting posture. The deficient aëration may be sufficient to

* *Practice of Medicine*, vol. ii, p. 255.

† *Practice of Medicine*, p. 319.

‡ *Ibid.*, p. 255.

excite stupor. It must be understood that these symptoms in the Antimonium tartaricum case are not dependent upon impaired cardiac action.

*Antimonium sulphuratum auratum* is to be used in those cases which, while presenting the chest symptoms of Antimony, are associated with a chronic naso-pharyngeal catarrh. There is a yellowish, greenish discharge from the posterior nares, with frequent inclination to hawk and spit.

*Antimonium arsen.* in cases succeeding influenza, attended by loud, moist râles, dyspnœa, feeble circulation, anxiety, restlessness, asthmatic breathing, orthopnœa, emphysema, and myocardial changes.

*Arsenicum album* is indicated mainly in cases associated with emphysema, disease of the heart, and chronic forms of nephritis, and in the chronic bronchitis of the aged; dyspnœa is a prominent feature; bronchial secretion is scanty, and there is a sensation of dryness referred to the situation of the bronchial tubes. Œdema of the lungs; marked debility; anæmia; dropsy; anxiety; restlessness.

*Terebene* first came into favor through the recommendation of Wm. Murrell as a remedy for "winter cough." It is certainly efficacious, but is objected to by some patients because its taste persists should there be any gastric flatulence. The dose is three minims, three or four times daily. It is best administered on a lump of sugar, or on sugar discs.

*Terpin hydrate* has the advantage over Terebene of being tasteless. It is used empirically. It is a drug that has grown in favor during the past ten years, and may now be said to be generally popular. Under its influence expectoration is made easy, and the cough gradually ameliorates. The practice of combining it with Heroin is not to be recommended. The dose is three grains every two hours.

*Ipecacuanha* is indicated far more frequently in the acute than in the chronic cases of bronchitis. In the latter, it is to be regarded more as an intercurrent remedy, being indicated by great accumulations of mucus associated with retching and vomiting. The cough is attended by suffocative sensations. Asthmatic paroxyms supervene upon the bronchitis.

There is a large list of drugs which contain volatile or fixed oils which are eliminated by the respiratory mucous membrane, and which exert a beneficial influence in the treatment of bronchitis. This list includes *Allium* (garlic), *Asafœtida*, *Abies*, *Copaiva*, *Cubebs*, *Turpentine*, *Balsam of Peru*, *Sabal*, *Senecio*, *Eucalyptus*, *Myrtus communis*, and some others.

*Allium* has long been used as a remedy in bronchorrhœa, the special symptoms indicating it being morning cough with copious expectoration, mucous râles in the bronchi, and great difficulty in expectorating a glutinous mucus with oppression of the chest at night. Sometimes the sputum has a foul odor; stitches in the shoulder blades and pectoral muscles, increased by cough and deep inspiration; aggravated by fresh cold air, by atmospheric changes, after rest; general lassitude.

*Asafœtida* is indicated in cases presenting very similar symptoms to those of Allium sativum. It is especially useful in the bronchorrhœa of the aged, especially if they are of a nervous or hysterical temperament. It should be used in somewhat material doses, *i. e.*, one or two grains every three hours.

*Abies nigra* is used almost entirely in domestic practice. Its action is very similar to that of turpentine.

*Copaiva* is called for in cases of bronchorrhœa, the sputum being greenish, purulent and fœtid. It is sometimes present as thick, heavy masses of yellowish or greenish and putrid-tasting mucus. It may be blood-tinged. Respiration is easier when the patient is bolstered up in bed. Night sweats and emaciation. Copaiva is best given in five to ten drop doses of the tincture.

*Cubebs* is indicated in cases in which the expectoration consists of stringy white or gray mucus.

*Terebinthina* is another remedy for the chronic bronchial catarrh of old people. Expectoration is copious and muco-purulent. This remedy has declined in use very much of late years owing to the popularity of its derivatives, Terebene and Terpine hydrate, which have very largely taken its place.

*Balsam of Peru* has been much used in old fœtid bronchorrhœas. Loud râles are audible through the chest; the sputum is thick, creamy, yellowish white, and sometimes fœtid. The constitutional symptoms suggest the presence of cavity; hectic fever; night sweats.

*Gummi ammoniacum* is useful in the bronchorrhœa of the aged; oppression in the chest owing to the accumulation of mucus; stitches in the left side of the chest when taking a deep breath; rheumatic or gouty subjects.

*Eucalyptus* is an unproven drug. It has been largely used in cases presenting a profuse muco-purulent expectoration, loss of weight, and night sweats. It has given its most successful results when administered in five drop doses of the tincture.

*Senega* is a remedy for the chronic cough of old people; the sputum consists of watery mucus in large quantities; or of tough mucus, which is expectorated with difficulty; cough dry and paroxysmal, and worse at night; great debility.

*Grindelia robusta* is adapted to cases of chronic bronchitis which are attended by difficulty in breathing (asthma). In such cases the cough is dry, and expectoration slight or absent; there may be coarse râles audible in the chest. Also in bronchorrhœa, with tough, whitish, mucous expectoration difficult to detach.

*Ammonium carb.* is one of our most valued remedies in the chronic bronchitis of the aged. The bronchial secretions are copious, but are ex-

pectorated with the greatest difficulty. The patient is usually very feeble, and it is upon this condition that most of the Ammonium carb. symptoms arise. Low vitality is shown in the enfeebled respiratory and circulatory functions.

*Ammonium iodide* is recommended by Goodno in the bronchitis of rachitic or tuberculous children, who have feeble circulation, enlarged lymph glands, etc.

*Benzoic acid* is sometimes of use in the chronic bronchitis of rheumatic and gouty subjects, associated with offensive urine and asthmatic symptoms.

*Ammonium phos.* is another remedy for the chronic bronchitis of gouty subjects. The patient presents ample evidence of chronic polyarthritis.

Among the potassium salts, *Kali bichromicum* is more commonly used in the treatment of chronic bronchitis than is any other. Its great indication is the stringy character of the expectoration. The cough is resonant, whistling, with nausea and expectoration of thick mucus; whistling, loud rattling in the chest; difficult expectoration of bluish or slate-colored tough mucus, adherent, filamentous, sometimes fœtid; burning sensation in trachea and bronchi; aggravation in winter or during chilly summers; relief by sitting up in bed to breathe and bending forward, and expectoration of stringy mucus.

*Kali bromatum* also has the purulent sputum of slaty color; pruritus of the genitals; dry, fatiguing cough with difficult respiration followed by vomiting of mucus and food; aggravation at night and when lying down; tightness of the chest interfering with breathing.

*Kali carb.* has a dry cough; the characteristic aggravation is after 3 A. M.; stitching pains in the lower part of the chest; asthmatic breathing; œdema of the eyelids; weakness; coldness; emaciation.

*Creosote* vies with Terebene as a remedy for the winter cough of old people. The cough is spasmodic; expectoration is copious, and consists of a light-colored mucus.

*Causticum* presents as its characteristic feature a semi-paralytic condition, by reason of which the patient is able to expectorate but partially, *i.e.*, the sputum is raised to a certain extent and is then swallowed; involuntary escape of urine with the cough. Cough comes on when the patient gets warm in bed, or after regaining the natural heat from a colder state. Morning hoarseness. It is also to be regarded as one of our remedies for bronchitis occurring in gouty subjects.

*Bromine* is adapted especially to the more acute cases of bronchitis, when there is an associated catarrhal inflammation of the larynx and trachea.

*Spongia* is better adapted than Bromine to the chronic cases presenting simultaneous involvement of the trachea, larynx, and bronchi. The

cough presents the dry, barking, hollow, croupy sound incidental to such a condition. The sputum is scanty, tenacious, yellow. The patient complains of a constrictive spasmodic pain through the chest and larynx.

*Phosphorus* is indicated more particularly by the characteristics of the patient, *i. e.*, it is adapted to emaciated, cachectic, young, overgrown invalids. There is dry tickling cough in the evening with tightness across the chest and expectoration in the morning; tightness, soreness and rawness in the air-passages; aphonia.

*Rumex crispus*, though possessed of a good reputation in dry coughs, has never given me satisfactory results. Its characteristic feature is a cough excited by dry tickling sensations in the trachea and upper bronchi, aggravated by any act that disturbs the inflow of the respired air, as talking, eating, hurrying, etc.

*Lactuca virosa* is useful for an "incessant spasmodic cough, which threatens to burst the chest, always caused by a peculiar tickling in the fauces, which in turn seems to be produced by a sense of suffocation in the throat. Dry cough in short paroxysms, with shaking of the chest and shocks in the occiput; hollow, dry, spasmodic cough. Great tightness in the lower portion of the chest. Wakes suddenly at night with anxious tightness of the chest."

*Drosera* is used by the eclectics when the cough is dry and hoarse. This drug is so commonly identified with whooping-cough that it is scarcely ever thought of in other conditions.

*Sanguinaria* has a dry cough with irritation in the larynx; severe cough causing severe pain beneath the upper part of the sternum, without expectoration; teasing, dry, hacking cough with dryness of the air-passages; myalgic pains throughout the chest; articular pains and swelling.

*Chelidonium* is useful in cases of chronic bronchitis associated with gastro-duodenal catarrh and herpetic disorders; spasmodic cough aggravated in the morning and associated with rattling of mucus and free expectoration; as in Sanguinaria, there are sharp stitching (myalgic) pains in the chest, worse on deep breathing.

### Plastic Bronchitis.

The present status of the clinical experience with plastic or fibrinous bronchitis does not justify any positive assertions as to the value of any specific measures directed to the pathological condition *per se*. The most that can be done is to follow the well-known principles and indications pertaining to the treatment of patients with acute and chronic catarrhal bronchitis, together with such special measures that suggest themselves to us as of possible benefit. Quite naturally, we are led to make use of the measures that have proven so successful in the management of croupous laryngitis. These include measures to favor the throwing off of the

exudate and to prevent a recurrence of the same. The first indication is met—though it must be confessed not with entire success—by inhalations of steam. Some contend that lime water or solutions of the alkaline carbonates with glycerin nebulized will prove more effective. Some have advised the administration of emetics to throw off the exudate; but such a measure is irrational, because the exudate cannot be removed by this means unless it is loose; and we have no data for determining when such is the case. Moreover, emetics being depressing, they may prove harmful. Hence, as "hit-or-miss" remedies they are highly objectionable.

In the acute cases, the general management should consist of the measures already advocated when dealing with the treatment of acute bronchial catarrh. Greater care is required, however, in maintaining general nutrition, as this has a great bearing in hastening recovery and maintaining it.

Between the attacks, the hygienic principles involved in the prophylaxis of acute bronchial catarrh and the management of tuberculosis should be enforced. Chronic cases demand, when the circumstances of the patient will permit, a residence in a mild climate during the winter and early spring.

The remedies likely to prove of most value include *Kali bichromicum*, *Bromine*, *Spongia*, *Hepar*, *Iodine*, and the *Iodine* preparations. The indications for these have already been given in the sections devoted to the treatment of acute and chronic bronchitis. *Potassium iodide* in small doses —five grains three or four times daily—is believed to be efficient in eradicating the tendency and hastening the throwing off of the exudate. Oliver,* in his very careful study of this disease, announces himself as possessing very pessimistic views as to its therapeutics, placing his entire faith on hygienic management.

Thomas,† of the eclectic school, recommends *Lobelia*. With the casting off of the membrane he advises *Sanguinaria* as a stimulating expectorant.

### Bronchiectasia.

Any line of treatment outlined for cases of bronchiectasia must be accepted with considerable reservation, because this pathological condition is rarely, if ever, unassociated with other serious lesions. It must ever be borne in mind that dilatation of the bronchial tubes is secondary to any one or more of the following conditions: Chronic bronchitis, stenosis of bronchial tubes, bronchial obstruction, as from a foreign body, atelectasis, pneumonia, emphysema, tuberculosis, pulmonary fibrosis, and changes in the pleura. It is evident, therefore, that if the maximum of success attainable is to be reached one must direct his therapeutic efforts to the patient him-

* *British Medical Journal*, 1899, vol. i, p. 72.

† *Practice of Medicine*, p. 313.

self, to his primary pathological condition, and to the bronchial dilatation. It is only the remedies adapted to the latter that will be considered at this time.

The symptoms for which relief is demanded is the reduction in quantity and objectionable characteristic of the horribly offensive expectoration. The indication, then, is to prevent the retention and resulting decomposition of the bronchial secretion, as well as to lessen its quantity. For this purpose, various remedies administered by inhalation have been proposed and have been of some value. Inasmuch as they reach the seat of disease in such attenuated form, their beneficial influence as local remedies is greatly lessened. Chaplin* seems to have solved the problem, in a measure at least, by proposing and using continuous inhalations of Creosote and Cresolin. His method, originally adapted to hospital use, has been modified for private patients in their own homes by Fowler† and Godlee as follows:

"A small room should be set apart for the purpose, and should be cleared of furniture, except such articles as wooden chairs and a table.

"In order to prevent the smell of the creosote vapor from penetrating them, the patient should put on over his clothes a garment with sleeves shaped something like a smock frock.

"The eyes should be protected by well-fitting goggles,‡ similar to those worn by Alpine climbers when on the snow, or a mask may be worn, made of surgical strapping with two watch glasses between, the adherent surfaces corresponding in position with the eyes, and tied with strings at the back. Plugs of cotton wool should be inserted in the nostrils.

"Women should cover the hair with a bag similar to that sometimes used when bathing in the sea.

"Ordinary commercial creosote should be poured into a metal saucer on a ringed iron tripod, and the saucer heated with a spirit lamp placed beneath it.

"If the floor is of wood, the tripod should be placed upon a large flat stone slab, as the creasote may run over the edge of the saucer.

"As the creosote is heated, dense clouds of vapor arise and quickly fill the room.

"The effect upon the patient is to produce violent cough attended with profuse expectoration; nearly two-thirds of the daily quantity being usually ejected during the bath; vomiting may follow the cough.

"At first the bath may be given on alternate days for a quarter of an hour or twenty minutes; but when the patient has become accustomed to the treatment, the bath should be given daily, and the duration of it gradually increased up to an hour or an hour and a half. Some patients are able

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* *British Medical Journal*, 1895, vol. i, p. 1371. † *Diseases of the Lungs*, p. 138.

‡ One of the many types of goggles worn by automobilists will prove useful.

from the first to take a creasote both daily, and to remain in it for a longer period than above stated, and in severe cases it may be used twice daily."

Chaplin defends his treatment by reporting six cases seen within the year, in all of which remarkably fine results ensued. Fowler and Godlee likewise report excellent results. The treatment would therefore seem to be one that should commend itself to the profession at large.

Intra-tracheal injections, as recommended by Grainger Stewart,* have produced some good results, but the treatment is one that requires some technical skill for its application, and is not likely to prove available to general practitioners. The formula used mostly is Menthol, 10 parts; Guaiacol, 2 parts; Olive oil, 88 parts. Of this one drachm is injected into the trachea twice daily.

Under no circumstances should sedative remedies designed to allay cough be administered. The freeing of the chest from the bronchial secretions is the patient's salvation, and for this coughing is necessary. On the contrary, every means possible for encouraging cough should be adopted.

To avoid expectoration, what has not inaptly been called "coughing down-hill" may be advised. The patient lies prone on a couch with his head and chest hanging over the end. The influence of the cough in ridding the chest of the sputum is thus aided by gravity. Ewart† advises that the foot of the patient's bed be raised twelve or fourteen inches. This greatly eases the cough and favors expectoration.

The surgical treatment of bronchiectatic cavities has been suggested, and has been tried. The results are not encouraging. Hoffmann‡ has collected 23 cases from the literature, with 11 recoveries and 12 deaths. Roswell Park reports 23 cases. Fowler and Godlee are not pleased with their results, and discourage further attempts at operation. There is very little reason why the surgical intervention should succeed, for the cavities are usually multiple, and they are associated with other serious pathological changes. Only when a bronchiectatic cavity is single, and the associated lesions are relatively unimportant that operation should be advised.

The homœopathic remedies useful in bronchiectasia are mostly those having a relationship to chronic suppurative processes, as *Hepar*, *Silicea*, *Stannum*, *Stannum iod.*, *Sulphur*, and *Calcarea*. Their special indications are mainly of a general character, and not special to the pulmonary phenomena.

### Hæmoptysis.

The most important factor in the treatment of hæmoptysis is rest, with careful attention to every possible detail in its enforcement. The patient must be put to bed, his clothing being removed with as little help from him

* *British Medical Journal*, 1893, vol. i.

† *The Lancet*, July 18, 1901.

‡ *Diseases of the Bronchi, Pleura and Lungs*, Nothnagel's *Encyclopædia*, p. 206.

as is possible. His position in bed should be with head and shoulders raised, and lying on one side, as this decubitis enables the patient to cough and expectorate with a minimum of exertion. It has also been claimed that the semi-recumbent posture lessens the influence of gravity in perpetuating the hæmorrhage. The patient must be forbidden to leave the bed for any purpose whatsoever. The only exception to this rule to be made is in those instancss in which the patient cannot use the bed-pan without much straining; then we must choose between two evils, and rising to pass urine or fæces easily is most emphatically the lesser one. The patient must be forbidden to do any talking beyond that which is absolutely necessary, and even this should be conducted in a gentle voice.

Mental rest is fully as important as is the physical. The onset of an attack of hæmoptysis is usually the occasion for great alarm on the part of patient and friends. Quiet, firm assurance of a favorable outcome—excepting in those cases in which it is evident that a fatal termination is near at hand—should be given. The physician should show the courage of his convictions by maintaining a cool head. Everything tending to increase the circulatory excitement of the patient must be forbidden.

The question of suppressing the cough must be decided according to conditions. If the cough is dry and spasmodic, yielding little or no expectoration, the patient will be better off if the cough is throttled, which may be done most certainly by the administration of *Codeia phos.*, one-half grain, or *Heroin hydrochlorate*, one-twelfth grain. Either of these drugs may be repeated any time after the lapse of four hours, if the cough continues to be distressing, and the jarring of the chest is such as to lead to a return of the hæmorrhage. If the cough is attended by a free expectoration it is in the highest degree unwise to suppress it, because it is necessary that the accumulation of blood and mucus in the respiratory tract be expelled.

The temperature of the room should be such as not to irritate the respiratory tract—neither too hot or too cold, but just right. Usually this means from 65° F. to 70° F. The covering of the patient should be light, but sufficient. If the extremities are cold, they must be kept warm by warm bottles.

Ice-bags may be applied to the portion of the chest over the suspected seat of the hæmorrhage. Any benefit arising from them is due to a supposed reflex contraction of the bleeding structures. The ice-bag must not be applied next to the skin, but a light woolen compress should invervene.

Goodno.* speaks highly of the application of the Chapman water-bag at a temperature of 120° F. to the lower cervical and upper dorsal vertebræ.

If a nurse is demanded for the case, she must not be fussy, but quiet and reliable.

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* *Practice of Medicine*, vol. ii, p. 297.

The stomach demands attention. During the hours immediately succeeding the onset of the hæmorrhage but little attention need be given the question of feeding. The patient can well afford to permit his stomach to rest. The diet should be prescribed according to the condition of the stomach. If the latter organ is bad, it is usually wise to feed by nutrient enemata. In the majority of cases the patients do well on light food, generally of liquid character, and in small quantities at relatively short intervals. To save the patient's strength as much as possible, it should be administered a spoonful at a time by the nurse or attendant. Nausea, when present, should be controlled by giving small pieces of ice. Attention must be paid to the temperature of the food, which should not be excessively hot or cold.

In very obstinate cases, the "bleeding of the patient into his veins," as suggested by Dawbarn and described in the section on Hæmatemesis, should be tried.

The use of astringents, as gallic acid, acetate of lead, etc., is not to be recommended. It is inconceivable that they are capable of doing any good, and it is possible that they may disorder the stomach.

There is a widespread confidence in the efficacy of Ergot in relieving pulmonary and other hæmorrhages. Wood * speaks in the highest terms of it, and advises that it be given in very large doses hypodermatically. And yet, logically, there is no reason whatever that Ergot should do anything but harm. It does not influence the size of the pulmonary vessels, and it does increase the systemic blood-pressure.

Remedies which promote the coagulability of the blood may be prescribed. The two which deserve the highest mention are *Calcium chloride* and *Gelatin*. The internal administration of Calcium chloride is not ideal, as too long a time must elapse before results are obtained. For this reason, it should be administered hypodermically in two or three grain doses.

*Gelatin* as a remedy for hæmorrhage is a debatable remedy, as the testimony in its favor is not unanimous. The usual urgency of the occasion makes the preparation of the gelatin solution for hypodermic use impracticable. Tickell † reports five cases of hæmoptysis in which he successfully used rectal injections of gelatin. The advantage claimed for the method lie in the painlessness of rectal injections, the freedom of danger from infection, and the absence of febrile rises. He advises the following solution: One and three-quarters ounces of gelatin are dissolved in two and three-quarters pints of boiling water, and boiled very gently for one hour, when the volume will have been reduced to one quart. The solution is then cooled to the body-temperature, and one-half pint slowly passed into the rectum from an ordinary irrigator. The injection is re-

* Wood and Fitz, *Practice of Medicine.*

† *Lancet*, Feb. 28, 1903.

peated three times daily until the sputum no longer shows any traces of blood.

*Nitrite of Amyl* is praised highly by F. Hare.* He believes that the drug acts by preventing the influx of blood to the ulcerated lung tissue, thus preventing the flooding of this tissue, and the evil effects of putrefaction, etc., as well as by stopping the hæmorrhage. The other vaso-dilators having a more permanent action, as *Glonoin*, *Sodium nitrite*, and *Erythrol tetranitrate*, may also be tried. These vaso-dilators are to be especially commended in the hæmoptysis occurring during the course of interstitial nephritis when arterial tension is high.

*Suprarenal extract* and *Adrenalin* are not to be commended, although they have the weight of some authority supporting their use. They have been suggested because of their ability to produce vaso-constriction. Dickson† has shown that Adrenalin given hypodermically exerts its influence for but a short distance about the site of injection.

*Atropine sulphate* is recommended by Soble,‡ in doses sufficiently large to obtain the vaso-dilator effect of the drug. He advises a single hypodermatic dose of one-sixtieth of a grain,or sufficient to produce dilatation of the pupils. His experience is based upon four obstinate cases.

*Aconite* is the remedy which will be found indicated in the majority of cases of hæmoptysis at the beginning. The mental anxiety, restlessness, the bright red blood mixed with frothy mucus, and the fever and the hard hacking cough, excited pulse, stinging pains in the chest, and flushed cheeks are the indicating symptoms. Under no circumstances should this remedy be given in doses sufficiently large to act as a cardiac depressant, for medicines of this class are detrimental.

*Sulphuric acid* is a remedy which has been but little used as a curative one in hæmoptysis. Goodno§ speaks of it as having proven beneficial "for cases of persistent hæmoptysis, the blood being dark, and not marked by great quantity at a time, but by continual oozing. It agrees well with feeble anæmic women. It is best prescribed in ten to twenty drops of the acid in four ounces of water, teaspoonful doses every one to three hours."

*Ipecacuanha* is highly praised by both schools of medicine. Hobart Hare‖ quotes Trousseau approvingly to the effect that Ipecac is a true hæmostatic in small doses. Others of the old-school use it in large doses as a depressant, as in asthma. This use of the drug is to be condemned as useless if not dangerous. Our use of Ipecac is based upon the presence of the following symptoms: Expectoration of bright red blood; nausea.

*Hamamelis* is indicated in cases in which the expectorated blood is dark in color, as if it were venous, so to speak. There is a tickling cough

* *Australasian Medical Gazette*, Feb. 20, 1904.
† *The Lancet*, 1906.
‡ *Medical Record*, vol. xli, p. 11.
§ *Practice of Medicine*, vol. ii, p. 298.
‖ *Practical Therapeutics*, 8th edition, p. 275.

and the lungs feel sore and bruised. Additional indications, not relative to the respiratory system, include the presence of varicose veins in various portions of the body, as the legs and hæmorrhoidal area. It is highly recommended by Hare * and Ringer.†

*Erigeron* ‡ is indicated when the blood is bright red in color; it is best prescribed in doses of three drops of the oil of Erigeron on a lump of sugar.

*Veratrum viride* is indicated in cases attended by full bounding pulse, similar to those which call for Aconite, but lacking the nervous symptoms peculiar to the latter remedy. There are burning and pricking sensations in the cardiac region; breathing is rapid, and the patient has faintness and nausea.

*Lycopus* is highly praised by Goss, of the eclectic school, and is endorsed by Thomas.§ Goss declares that he has seldom been obliged to have recourse to any other remedy. Hale, likewise, brings forth his testimony in favor of this drug, and: "If there is no fever, and the pulse is quick and irritable, especially in tubercular subjects, it is very serviceable. It is also useful when mental excitement or physical exertion is the cause of the hæmorrhage. The dose is 15 to 30 drops of the tincture every half-hour."

*Geranium maculatum* is recommended by Blackwood || in doses of 10 to 20 drops of the tincture every twenty to thirty minutes to control the hæmorrhages attendant upon the late stages of phthisis. The flow of blood is bright red, persistent and free.

*Millefolium* is likewise recommended by Blackwood for the hæmoptysis of pulmonary tuberculosis with cavity formation. There is a flow of bright red blood. The case lacks the fever and restlessness of Aconite Oppression and palpitation are present; cough is but slight.

*Ferrum phos.* is the best remedy for the slight hæmorrages of early tuberculosis. It is especially indicated in young, overgrown subjects, subject to attacks of acute bronchial catarrh, headache and epistaxis.

*Ergot*, though condemned as a physiological remedy, is sometimes indicated from a homœopathic standpoint. Lilienthal ¶ gives as the indications: "*Passive pulmonary hæmorrhages*, mostly venous, but may be arterial, usually preceded by a sense of pressure upon the chest, with anguish, faint feeling, weak and small pulse; patient *wants to lie with head down*, and wants the windows open." Hale commends especially the 2x or 3x dilution given hypodermatically.

*Hydrastinine hydrochlorate* is highly recommended by Dr. O. S. Haines, and endorsed by Goodno. There seems to be great differences of

* *Op. cit.*, p. 226. † *Handbook of Therapeutics*, 13th edition, p. 341.
‡ Gatchell, *Diseases of the Lungs*, p. 174. § *Practice of Medicine*, p. 333.
|| *The Clinique*, September 15, 1899. ¶ *Homœpathic Therapeutics*, 3d edition, p. 483.

opinion respecting the value and safety of this drug. Some even look upon it as dangerous *. The balance of testimony is in its favor. It is admitted that many preparations are unreliable. The maximum hypodermatic dose should be one-quarter of a grain. Gatchell † advises it especially in the subjects of old bronchial catarrhs.

For the hæmoptysis of cardiac disease, the remedies are *Cactus* and *Digitalis*. It should be remembered that in many cases belonging to this class, the hæmoptysis is not an unmixed evil, the patient feeling better thereafter.

For the anæmia following hæmoptysis, *Cinchona* and *Chininum arsenicosum*.

For the hæmoptysis of old people, Sir Andrew Clark recommended, when all other remedies fail, small doses of *Mercurius dulcis* at night, followed by a saline laxative in the morning.

## Asthma.

The successful treatment of asthma demands a most careful study of the patient. As a rule, he is found to be an individual of highly nervous temperament, and this of itself makes him very difficult to manage. There may be, in addition, a true neurasthenic or hysterical condition, which of itself demands attention according to the rules laid down in another portion of this volume. The popular estimate of the outlook of the asthmatic patient is gloomy in the extreme. There exists, moreover, a general feeling that legitimate physicians are capable of doing little or nothing in the way of ameliorating the disease. In fact, an intelligent layman—a man who one would have thought capable of thinking or saying better things—once remarked to me that "quacks succeeded in curing this disease when regular practitioners failed utterly." And yet there is not a remedy used by these gentry that is not available to and used by the legitimate practitioner.

Etiological factors demand attention. Right here we encounter our first difficulty, because the influences which bring about an attack in one individual are the ones which may be successfully employed for relief or curé in another. Hence, each case, as stated above, must be carefully studied, and the effects exerted by various external agents noted. The statement on the part of the patient as to the agents producing amelioration and aggravation must be treated with consideration, no matter how ridiculous it may appear on its face. The history of the treatment of asthma is full of apparent inconsistencies.

The treatment of asthma resolves itself into the management of individual paroxysms, and the prevention of attacks.

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* Foster's *Practical Therapeutics*, vol. i.

† *Diseases of the Lungs*, p. 175.

I. **The Treatment of the Paroxysm.**—We have a number of remedies which are very efficient in relieving the asthmatic seizure. Unfortunately, they are of such a character that their repeated use is by no means to the permanent welfare of the patient. Educated practitioners have, therefore, fought shy of their use, which has with great avidity been taken up by the quacks. Goodhart * not inaptly remarked that "the treatment of asthma becomes too often a repeated sacrifice to the paroxysm." The same author, continuing his remarks, says: "But this plan of campaign is ultimately a most disastrous one. It unquestionably produces temporary ease; but what happens afterwards is this: The vapor on reaching the mucous membrane stupifies or exhausts the nervous centres and stops the spasms for a time. But at the same time some of these remedies, by stimulating the mucous membrane and provoking the flow of mucus, make the local erethism worse than it was before. The more sedative kinds of inhalations do but appease by offering bribes to vicious nervous influences. By and by the nervous centres wake up to find matters no better, rather the contrary; and then comes on the spasm again, and the whole process is repeated; and with each repetition of the cycle the nervous centres, as their nature is, become more exhausted and more irritable, their sleep is shorter, their spasm is more and more quickly repeated, and the poor patient lands himself, with perhaps some lessening of the severity of each paroxysm, in a more prolonged or persistent stuffiness, hardly less distressing to bear. All day long he appeals to his powder, and becomes in fact the slave of an appetite he has whetted and that he cannot now control. Thus ends the chronic asthmatic who betakes himself to vapors. But this is not all, for, by common consent, a repeated application to some of these drugs, whether by making matters worse in the lungs, or by worrying the cardiac ganglia, or what not, tends to cardiac dilatation, and is equivalent to a good many nails in the coffin of the asthmatic." While expressing my firm belief in the value of Goodhart's opinion as thus expressed, nevertheless I feel equally certain that there are occasions when such palliative measures are actually demanded until by our curative treatment we can regain the control of the illness. Relief is demanded, and that quickly. If we do not give it intelligently, then the patient will get it unskilfully administered at the hands of empiricists and quacks. The number of cases in which such measures are demanded is relatively very small; and it is this minority whose interests we must conserve. The difficulties in their management are at times almost insuperable, if we cannot offer measures for palliation of individual seizures.

The selection of a measure that will bring relief to the individual sufferer is very largely a matter of experiment. The remedy which affords unspeakable relief to one patient most unaccountably fails in the treatment

* Allbutt's *System of Medicine*, vol. v, p. 303.

of a case of similar character. The physician is, therefore, obliged to start with such measures as offer a prospect of success, and ring the changes until one is found that is attended by satisfactory results.

The fumes of burning nitre paper is a remedy that may be regarded as the simplest. A saturated solution of saltpetre is first prepared, and in this sheets of bibulous paper are thoroughly soaked. The latter are now thoroughly dried, and are then ready for use. At the beginning of a paroxysm, a piece of the nitre paper is placed in a saucer and burned, the patient inhaling the fumes; or a piece of it may be rolled into the shape of a cigarette and smoked.

In the case of persons not accustomed to smoking to any extent, tobacco is occasionally found to be an all-sufficient palliative. Hyde Salter speaks favorably of the action of tobacco as a palliative during the paroxysms. The drug may be used in one or two ways: As a depressant,* it is prescribed for persons not accustomed to its use, and produces a depression that is profound, often amounting to actual collapse, and giving speedy and complete relief. The habitual user of tobacco, on the other hand, cannot be made to feel the use of the depressing effects, no matter how large a quantity he may consume. It is then advised for its composing and tranquilizing effects, which are well known to all smokers. He† speaks of asthmatics as very commonly smokers, and says that "many of them find in the habit an almost unfailing antidote to their disease." More frequently the smoking of cigarettes in which a large proportion of Stramonium leaves has been incorporated with the tobacco will be found successful. S. G. L. Brown,‡ of Shippensburgh, Pa., reports that the subjects of asthma if accustomed to the use of tobacco are undoubtedly benefited by putting twenty drops of Kola tincture into a two ounce package of pure tobacco. At the expiration of twelve hours it is ready for smoking. He looks upon Kola as a reconstituent tonic, where the stomach and nervous system are at fault. He declares that the result is often a little short of magical. The same authority thinks the greatest relief from the individual paroxysm is to be obtained from inhalations of Pyridin. Sometimes during an attack relief is experienced upon spraying rapidly the back and chest of the patient with chloride of methyl. But a small portion of the body should be exposed to the freezing action of the latter drug. It undoubtedly acts reflexly by producing a violent peripheral irritation. H. C. Wood§ recommends the smoking of cigarettes prepared according to the following formula:

* *On Asthma, Its Pathology and Treatment*, p. 99. † *Op. cit.*, p. 115.

‡ *Medical Century*, April 1, 1899. § Wood and Fitz, *Practice of Medicine*, p. 1065.

℞ Belladon. fol. . . . . gr. xcvi.
Hyoscyam. fol.
Stramon. fol. . . . . āā gr. xlviij.
Extr. opii, . . . . . gr. iv.
Tabaci, . . . . . gr. lxxx.
Aquæ, . . . . . Oj.
M. ft. sol. et adde,
Potass. nitratis, . . . . . gr. clx.
Potass. arsenitis, . . . . . gr. cccxx.

Saturate bibulous paper with this solution and dry for use. The paper is to be rolled into cigarettes, one of which is smoked until relief is afforded or some giddiness is produced.

Another plan suggested is to soak Stramonium leaves in a saturated solution of saltpetre and dried. They may then be used for making cigarettes, which are employed for relief during the asthmatic paroxysms.

The drugs belonging to the Nitrite of Amyl class have been found efficacious in some cases. Nitrite of Amyl itself may be inhaled in doses of two or three minims. The relief afforded by it is remarkable in the limited number of cases in which it is effective. It has the disadvantage of being but temporary in its action. Nitrite of sodium in doses of from two to five grains, and Glonoin in one minim doses of the second decimal dilution act favorably in cases susceptible to Amyl nitrite. Their good effects are also more lasting.

Drugs which have a physiological action opposed to that of the Nitrite of Amyl class may likewise be administered with benefit. Thus, the hypodermic administration of Adrenalin, 1:1000, solution, in quantities ranging from three to six minims, has cut short attacks within twenty minutes.

Babcock* makes a very interesting, and to me a new suggestion, as follows: "If the characteristic urticarial line produced by drawing the finger-nail or the blunt end of a pencil firmly across the skin, it indicates capillary paresis and points to hyperæmia of the bronchial mucosa. Under such circumstances, speedy relief from the asthma is likely to follow if one-eighth of a grain of *Suprarenal extract* is dissolved on the tongue every two or three hours. When, on the contrary, a white line remains on the skin, there is capillary spasm, and vaso-dilators, as *Amyl nitrite* or *Nitroglycerin*, afford relief.

"My experience has accorded with the truthfulness of the above statements. In one case in which dermographia was present, the suprarenal extract brought cessation of the asthma after a time and also warded off other attacks. In other cases, which did not show this irritability of the capillaries of the skin, the remedy proved entirely useless."

Occasionally, a patient is found who is greatly relieved by a cup of strong coffee. Caffein citrate may be employed as a remedy in such cases.

* *Diseases of the Lungs*, p. 109.

West* advises the addition of a teaspoonful or two of brandy to the cup of coffee as intensifying the favorable action of the latter.

Chloroform is a possible palliative. It is capable of bringing about relief when administered by inhalation in doses far short of producing anæsthesia.

The palliative which is the most certain to relieve the attacks is Morphia. It should be administered hypodermically in one dose of one-quarter of a grain combined with sulphate of Atropia, $\frac{1}{120}$ of a grain. This practically never fails to bring the desired relief. It is a remedy, however, the administration of which must always be kept within the control of the physician; otherwise, the Morphia habit may be induced.

A very simple mechanical expedient that has been found efficient in a number of cases is artificial expiration. It is well known that the asthmatic paroxysm is attended by an inability on the part of the chest to expel the contained air. It has therefore been suggested that the deficiency on the part of nature be made up by assisting the expiratory act by compression of the thorax maintained throughout what should be the expiratory period. This is certainly an innocent procedure, and can do no harm in any event. It is therefore to be commended.

Chloralamid (gr. xx), Trional (gr. xv), and Veronal (gr. xv.) will generally bring relief by reason of their hypnotic action.

II. **Curative Treatment.**—The successful treatment of the asthmatic patient demands attention to every possible hygienic detail. This includes the removal of any special source of ill-health that may be present and act as a reflex cause, and attention to diet, mode of living, clothing, hydrotherapy, electro-therapy, climate, and proper balancing of rest and exercise.

Our friends the rhinologists have had much to say concerning the relationship existing between asthma in children and post-nasal adenoid and tonsillar hypertrophies. Medical literature contains many records of successful results attendant upon the removal of these complaints. In our enthusiasm over this subject we must not presume that the remedy is a specific, even though the throat lesions be well-pronounced. It should be borne in mind that asthma is, to a certain extent, like epilepsy. As the latter disease is ofttimes but the formation of the convulsive habit resulting from the neglect of reflex convulsions in infancy and early childhood, so may a neglected post-nasal disease awaken the asthmatic habit, the latter continuing long after the cure of the primary lesions by operation. *In every case of asthma in children, it should be the duty of the physician to have the throat and post-nasal space carefully examined and all discoverable lesions promptly removed.* Less frequently, other nose and throat lesions than adenoids are the cause. Asthmatic patients, as a rule, stand in more

* *Diseases of the Organs of Respiration*, vol. ii, p. 594.

or less constant dread of taking cold. One might truly say that they are almost hypochondriacal on the subject. The morbid care they take of themselves serves to convert them into veritable hot-house plants. Necessarily, they bring about the very condition they desire to avert. It is important, therefore, that the patient be taught to bring his body up to something approaching the normal standard. In some of the high grade neurotics with lowered nutrition it is necessary to adopt the rest treatment, though usually not for the length of time required in cases of pure nerve prostration.

Dietetic measures must be advised according to the peculiarities of the patient himself, regardless of the fact that he is suffering from asthma. Thus, if he exhibits a well-defined gouty inheritance or constitution his diet must be regulated accordingly. As a general rule, it is a wise plan to insist upon the best meals being taken in the early part of the day. Thus, the patient may be ordered a full breakfast, a moderate dinner, and a sparing supper. Above all things, food must be properly prepared; plenty of time must be taken for thorough mastication; and a short rest must be taken after each meal. Under no circumstances should food be taken in excess or insufficient quantities to produce epigastric discomfort or embarrassment of respiration. When patients are either under- or over-weight, it is important that their eating habits be studied in careful detail in order to determine whether they have been taking the proper quantities to maintain a normal balance between waste and repair. Our subsequent instructions should be guided by the result of this inquiry.

Most patients are greatly benefited by the cold sponge bath taken every morning (See article on Hydrotherapy.)

Climatic treatment is of value, but must be regarded as experimental. One can never tell *a priori* whether a case will be benefited by a sojourn in a particular locality. As a rule, high and dry climates are found to be the most advantageous. At the same time, it must be remembered when the asthma is associated with emphysema, as most of the long-standing cases are, high altitudes are likely to disagree. When cases are associated with a chronic bronchitis, it is wise, when the patient's means will permit, to send him to a mild climate, as Florida or Southern California, during the winter months. Some cases are benefited by an ocean voyage, or a sojourn at the seashore. Others, as if to afford practical evidence of the perversity of the disease, are greatly aggravated. Many cases find it necessary to reside in a city; in fact, they seem to be helped or even kept in perfect comfort thereby, and undergo seizures as soon as they remove to the country. Sometimes the city smoke and dust seem to be beneficial. In other cases they are equally prejudicial to the patient's welfare. In any event, in seeking a climate for the asthmatic subject, those localities in which he is liable to be exposed to high winds must be avoided. Resorts of this country

that may be suggested include Atlantic City, Lake Placid in the Adirondacks, Hot Springs of Virginia, Jefferson, Jackson, and Pemigawasset Valley in the White Mountains, and Phœnix, Arizona. In the case of aged patients, whose arteries have undergone sclerotic changes, high altitudes must be avoided. Very little can be done for such cases because they have an organic basis; besides, the high altitudes are unfavorable to the arteriosclerosis.

Huchard,* believing that the asthmatic seizures are dependent upon the absorption of ptomaines from the alimentary canal, has treated a number of cases successfully by an absolute milk diet. The milk must not all be given during the day, but one liter during the evening and one-half liter during the night.

With the electrical treatment of asthma I have had no experience. King† does not seem to be very enthusiastic as to the results. He does not hesitate to admit that efforts have met with "no appreciable success," though he claims that where the spasmodic element is marked this particular symptom has been ameliorated. The methods of treatment advised are galvanization of the vagus by Rockwell; faradization of both pneumogastrics by Erb; and the static spray and the static spark by Larat. H. Lewis Jones does not regard the electrical treatment of asthma to be of sufficient importance to give it mention; and the same is true of Dawson Turner, Liebig, and Rohe in their text-books.

Goodno‡ speaks more favorably of the action of electricity in asthma than does any other author. He says: "Galvanism may be useful as a part of the interparoxysmal treatment. There should be daily applications for fifteen minutes of a current as strong as the patient can comfortably bear. According to my method, one electrode should be three or four inches wide, and long enough to surround the chest, the other should be applied to the lines of the pneumogastric nerves in the neck and to the upper spine. The former should be occasionally shifted from the level of the epigastrium upward."

The asthmatic patient should learn to accustom himself to the standard of clothing worn by the average healthy individual. In other words, he must be sensible; neither hysterically careful or outrageously careless. Either extreme is harmful. Woolen garments should be worn next the skin during the winter. Ringer§ advises the wearing of a chamois-leather vest over the flannels, as it has proven of advantage in some cases.

Of the medicines which are to be used for the eradication of the asthmatic habit, I have long looked upon *Kali hydriodicum* as the leader *par ex-*

* *University Medical Magazine*, February 1896, p. 376.

† *Electricity in Medicine and Surgery*, II, p. 280.

‡ *Practice of Medicine*, vol. ii, p. 269.

§ *Handbook of Therapeutics*, 13th edition, p. 76.

*cellence.* I have now had sufficient experience in its use to teach me to place in it very great reliance. It is not a specific, for it often fails. Its action is sometimes aided by alternation with Belladonna or Atropia (*vide infra*). It should be given in relatively small doses, *i. e.*, five to ten minims of the saturated solution, three times daily, in not less than a wineglassful of water, and after meals. The experience of others in its use is as favorable as my own. It does not seem to have much, if any, effect in shortening individual paroxysms; but in cases in which the attacks reappear night after night with more or less disturbed respiration and diffused bronchial râles during the day, it soon brings about a restoration to health, and prevents a recurrence. But little is said of this valuable remedy in the present connection by the materia medicists of our school. I have observed cases in which the continued use of Potassium iodide in non-syphilitic individuals has produced excessive secretion of bronchial mucus with some shortness of breath. Diagnosticians have long recognized this effect of the drug, and have employed it to produce an expectoration in order to bring out localized râles and to secure sputum for the detection of the tubercle bacillus. Baehr* quotes from the *Deutschen Klinik* of 1856, to show that Iodine can produce asthma. In three cases "the asthma set in after a protracted use of Iodine, whereas an acute intoxication with Iodine never causes asthma; the paroxysm sets in toward evening, or more commonly about midnight, and lasts about half-an-hour; in one case it commenced with symptoms of laryngismus stridulus; the paroxysm was succeeded by excessive lassitude and an irresistible desire to sleep." Baehr closes his remarks concerning the remedy as follows: "Hence, Iodine corresponds well with the purely nervous asthma, for which it has been prescribed more recently by several old-school practitioners; of course, in enormous doses. Except a few not very striking cures, homœopathic literature does not offer any cases of asthma successfully treated with Iodine." Hughes† believes the evidence at hand is sufficient to behoove the homœopathic physician to avail himself of this action of the drug.

Jousset,‡ of the members of our school, stands alone in according praise to the action of Potassium iodide in asthma. He makes it one of his chief four remedies, and remarks that "both empiricism and pathogenesis of this drug caused it to be used in this affection." . . . "The now better-known relations between arterio-sclerosis and pulmonary emphysema explain the reasons of the success in certain number of cases by treating with Iodine preparations, There are physicians who prescribe Iodide of potassium to every asthmatic patient, and increase the dose of the remedy until they obtain an amelioration. From such a practice it follows that when Iodine is not indicated this remedy acts as a simple pallia-

* *Science of Therapeutics*, vol. ii, p. 319.

† *Therapeutics*, ii, p. 164.

‡ *Practice of Medicine*, p. 824.

tive, with all its disadvantages, and particularly the following: patients are obliged to take each day enormous doses of Potassium iodide under penalty of seeing the paroxysms return with their full violence." He makes the special indications of Potassium iodide in asthma to be "long attacks of dyspnœa comparable to asthma, accompanied by considerable rush of blood to the chest and to the upper part of the body. The relation of asthma to arterio-sclerosis usually associated with habitual emphysema gives value to the selection of Potassium iodide." My experience is opposed to this teaching, for I have never seen the habituation to the drug to which Jousset refers, nor have I known patients to experience any bad effects except in rare instances, the mild physiological effects of the Potassium iodide. I have not made arterio-sclerosis an indication for the drug. If given with this condition present, I can see that it might be capable of bringing about an undesirable lowering of vascular pressure. With arterial changes associated, I would much prefer *Aurum mur.*, 2x, in doses of five minims three times daily.

There are some persons who cannot take the ordinary Iodides without incurring disagreeable symptoms, as coryza, gastric disturbance, etc. In two such patients suffering with asthma I have made use of *Sajodin* (the *Monoiodobehenate of calcium*) in doses of five grains three times daily. This drug is inert as long as it remains in an acid medium, hence does not give the action of its contained iodide until it enters the duodenum.

*Kali bichromicum* is also a valuable remedy. Its special indications include the association of asthma with bronchiectasia and emphysema, or dyspnœic seizures actually dependent upon the latter lesion. The expectoration is very tenacious, and brings great relief. In another type of asthma, Kali bichromicum is suitable when the paroxysms return in winter weather, or in the summer time, when the patient has been chilled from any cause. The individual paroxysms are aggravated about three or four o'clock in the morning.

*Aconitum napellus* is suited to cases in which the attacks follow "colds" brought on by exposure to dry cold air. Usually, a coryza first sets in, and this in a few days—about three or four—is followed by bronchial symptoms. These include cough with wheezing, some shortness of breath with aggravation when lying down. Then the true asthmatic paroxysms come on, and at the same time the coryza disappears. In other instances the coryza and the asthma are coincident. It is especially a remedy for the asthma of children when post-nasal adenoids are not the underlying cause.

*Arsenicum* is one of the favorite remedies of Jousset and Baehr. The former believes it to be the remedy in chronic cases which are associated *

* *Practice of Medicine*, p. 841.

"with whistling, paroxysmal, teasing cough; expectoration of a slimy transparent frothy fluid is present during the intervals between the attacks. The dyspnœa produced by Arsenicum is a true picture of the asthmatic attack; respiration difficult, anxious, whistling, with constriction of the chest, and even apnœa. Restlessness, cardiac anxiety, anguish, and nocturnal aggravations complete the indications of this remedy." Old-school writers, notably Stewart, Gibson,* and Goodhart,† place great reliance upon it as a remedy for warding off the return of the paroxysms. They prescribe it in moderate doses of Fowler's solution. They adopt, however, the precaution of suspending the drug after four weeks' administration.

*Nux vomica* is another one of Jousset's asthmatic quartette. It is interesting to note that its alkaloid, Strychnia, is likewise one of the chief remedies advised by the old-school authorities to whom reference has already been made. It is noteworthy that among the early successes of Hahnemann was a case of asthma cured by the administration of Nux vomica in material doses. Hughes ‡ regards it as the best curative medicine for simple spasmodic asthma. Jousset would place it as useful in cases similar to those above suggested as best suited to Aconite, namely, the simultaneous incidence of coryza, sneezing and asthma. All will agree that it is certainly the first remedy to be thought of in cases of asthma, in which the paroxysms bear an important relationship to gastric symptoms or dietetic transgressions. Farrington § does not look favorably upon Nux vomica as a remedy for the purely nervous type of the disease, although he admits its occasional applicability. He recommends it for the asthma "which arises from gastric disturbance. It is associated with a feeling of fulness and oppression in the stomach, particularly manifested after a hearty meal, during which the patient must loosen all the clothing about the hypochondria. The abdomen is distended with flatus. Belching relieves this asthmatic state. The symptoms are always increased by cold air or any exertion, especially ascending a height."

If *Strychnia* in material doses is selected as the remedy during the interparoxysmal period, I would caution against the administration of too large doses, as serving to increase an already existing nervous excitability. From the one-hundredth to the two-hundredth of a grain three to four times daily will be found most efficient. To push the drug to the extent of physiological action is not wise.

With *Sulphur*, which is Jousset's fourth remedy, I have had no experience. Modern pathology is rarely in accord with an indication such as the chief one given by Jousset, namely, "the increase of asthma with the decrease or disappearance of the tetter." Personally, I have never seen

* *Twentieth Century Practice*, vol. vi, p. 612. † Allbutt's *System of Medicine*, vol. v, p. 302.
‡ *Therapeutics*, p. 162, vol, ii. § *Clinical Materia Medica*, 2d edition, p. 178.

such. The nearest approach that clinicians will find to this class of cases are those in which asthma occurs in gouty subjects, and in whom the underlying condition is manifested at one time by asthma and at others by eczema, joint swellings, indigestion, renal calculus, etc. Farrington does not mention the remedy in this connection. Still, his work was not intended to be a complete one. Lilienthal, whose work * must be regarded as practically encyclopædic, likewise fails to mention it.

*Belladonna* and its alkaloid, *Atropia*, are great favorites with me in the treatment of what may be called the purely nervous type of cases. Judging from our literature, it does not seem to be possessed of much reputation by the members of our school. This I cannot understand, for we find it generally recommended for disease characterized by spasm of involuntary muscular fibre. Baeher is our only authority who seems to regard it as worthy of mention, and he gives as the indications certain peculiarities of the patients, "and concomitant symptoms," *e. g.*, "the attack is accompanied by congestion of the head and an affection of the larynx in the case of plethoric individuals, children and females of an irritable disposition." One does not get satisfactory results unless doses sufficient to produce physiological action are employed. Ten drops of the tincture of Belladonna may be given every two or three hours ; or Atropia sulphate, in doses ranging from $\frac{1}{400}$ to $\frac{1}{200}$, three times daily. A single hypodermic injection of $\frac{1}{400}$ of a grain is sometimes sufficient to cut short the paroxysm. But few patients can tolerate the repetition of the large hypodermic dose just mentioned. Salter and Ringer both praise the drug, and testify to its ability to allay both the cough and the oppressed breathing. In several instances I have given Atropia in alternation with Potassium iodide.

*Ipecacuanha* is used by both schools of medicine. Its homœopathicity to the affection is incontestable. Hughes† makes the association of bronchitic symptoms the important indication. Farrington‡ makes the indicating symptoms constriction of the chest aggravated by the slightest motion, cough associated with loud rattling of mucus within the chest but not followed by any expectoration, in persons sensitive to a warm moist atmosphere. The old-school physicians prescribe it in physiological doses as a depressant. Ringer advises the spraying of the pharynx with wine of ipecac. Jousset says its action is perfectly homœopathic, for asthmatic attacks have been produced by breathing the powdered drug. It is indicated by considerable dyspnœa, accompanied by wheezing and the first signs of asphyxia ; there is a peculiar cough, caused by a tickling in the large bronchi and accompanied by gagging and suffocation. He prefers the first decimal attenuation of the tincture, a teaspoonful every half-hour.

*Lobelia inflata* is likewise used by the physicians of both schools.

* *Homœopathic Therapeutics*, 3d edition.

† *Therapeutics*, vol. ii, p. 162.

‡ *Clinical Materia Medica*, 2nd edition, p. 346.

Its special indications include a weak sensation in the epigastrium spreading up into the chest, nausea, profuse salivation, sensation as of a lump in the stomach, contraction of the larynx and thorax, slow and irregular pulse. Hughes makes the general indication for its use a reflex irritation proceeding from the stomach.

*Cuprum metallicum* or *aceticum* has long enjoyed a reputation with us in the treatment of asthma because of its antispasmodic qualities. Blueness of the face and sensation of constriction of the larynx are its important indications. Goodno* places his faith in *Cuprum arsenicosum*, stating that recent experiences have convinced him "that it is a remedy of exceptional value in the ordinary type of bronchial asthma. One case of about eight years' standing was promptly relieved, and all symptoms disappeared within a few weeks. The patient was a neurotic woman thirty-five years of age. The oppression was constant, but subject to occasional severe aggravations for a few weeks."

Jousset,† likewise, thinks highly of Cuprum, considering it indicated by a spasmodic dyspnœa, with a feeling of compression in the chest, which amounts almost to suffocation. The cough is suffocating; if vomiting relieves the patient this is also an indication for Cuprum. The same holds good for cramps and muscular spasms which may appear in other parts of the body. He employs the sixth dilution most frequently, two drops in four ounces of water, and a teaspoonful every half-hour.

*Hydrocyanic acid*, like Cuprum, is indicated in nervous cases. As Hughes expresses it, in the cases which receive palliation from chloroform inhalations.

*Bisulphate of Quinine* is, so far as my knowledge of the literature goes, a remedy peculiar to Goodno. Of it he says: "It has repeatedly proven useful in purely neurotic cases. The lower triturations or grain pills, three times daily, have been most used, I (he) practically cured with quinine, *i. e.*, brought a gradual and finally complete cessation of the paroxysms for six years or until death from apoplexy, a case of twenty years' standing. There were associated with the asthma a highly neurotic stomach and emphysema with weak heart."‡

*Grindelia*, among the newer remedies, has established a very good reputation for itself. Although extensively used by homœopathic physicians, it is more of an empirical remedy. It should be administered in doses ranging from five to ten drops of the tincture every hour during the paroxysms, and at longer intervals between the attacks.

*Aspidospermine*, the active principle of Quebracho, has been used by Halbert§ successfully in the case of a mechanic, who for a long time had a chronic emphysema with acute asthmatic attacks. He used the second

* *Practice of Medicine*, vol. ii, p. 269.
† *L'Art Medical*, December, 1901.
‡ *Op. cit.*, p. 268.
§ *The Clinique*, August 15, 1899.

decimal attenuation of the drug every half-hour or oftener during attacks, and continued its use for a long time after. It not only aborted the acute attack but greatly relieved the emphysematous tendency.

Halbert* also recommends *Apomorphia* 3x as having controlled a severe paroxysm in one of his cases.

*Sambucus.*—Jousset† says this remedy is also indicated in the attack by the predominance of the dyspnœa over the cough; the face is violet and the signs of asphyxia are more advanced than in the Ipecac case. The wheezing which accompanies the dyspnœa is more marked. This drug is far from having the notoriety which Ipecac has, and at the same time it cannot be called a trustworthy remedy. It should only be prescribed when Ipecac fails. The mother tincture should be used, ten drops in four ounces of water, a teaspoonful every half-hour.

Fred. B Percy,‡ of Brookline, Mass., on the other hand, looks upon *Sambucus θ* as an efficient remedy in asthma. He reports five cases in which it gave remarkably good results. His patients ranged in age from eleven months to sixty years.

*Moschus.*—Moschus is recommended by Jousset§ during the attack when there is a very marked spasm of the muscles of the larynx and thorax, and is especially useful in children. The first decimal trituration may be administered by olfaction or internally in doses of one and one-half grains per powder.

## Hyperæmia of the Lungs.

### I. Active Hyperæmia.

The existence of active hyperæmia of the lungs as a special entity has been debated. It is readily conceivable that as a result of exposure to cold, undue exertion, irritating gases, etc., it may take place. Clinically, we observe cases which apparently are in the first stage of pneumonia, but which undergo rapid resolution without proceeding further. These present such phenomena as chill, slight fever, cough and expectoration. They should be subjected to the same general management as is indicated in the initial stage of pneumonia, namely, absolute rest in bed, liquid diet, and, when the indications suggest it, warm applications to the extremities. Some advise hot poultices to the chest. Gatchell ‖ advises the application of a hot compress to the chest for ten minutes. He has also found a hot bath (temperature 105° to 110° F.) beneficial, the patient to be immersed for a period of five to ten minutes. He is then removed and wrapped in blankets. This treatment induces a profuse perspiration.

The remedies called for are few in number and their indications well-defined.

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* *Practice of Medicine*, p. 419.
† *L'Art Medical*, Dec., 1891.
‡ *N. E. Medical Gazette*, December, 1892.
§ *Op. cit.*
‖ *Diseases of the Chest*, p. 225.

*Aconite* is indicated when the illness has been induced by exposure to cold, especially after undue exertion; the pulse is quick; the patient complains of pressing pains in the chest; fever is present and is associated with anxiety and restlessness.

*Ferrum phos.* is to be administered when there is fever, but without the anxiety and restlessness of Aconite; and the sputum is blood-streaked.

*Belladonna* is indicated in cases in which the congestive phenomena are widespread and intense. The face is flushed; the arteries throb violently; the skin bright red; dry cough, and expectoration blood-streaked.

*Veratrum viride* when the respirations and pulse are both rapid, the quality of the pulse hard and quick; the fever moderate.

*Phosphorus* finds its indications more in the characteristics of the patient, and the history of similar attacks to the one under treatment.

*Antimonium tartaricum* is to be used in cases presenting phenomena suggestive of pulmonary œdema; there are dyspnœa, cough, and large moist râles throughout the chest. Expectoration is difficult, notwithstanding the loose sound of the cough.

### II. Passive Hyperæmia.

This is divided into classes, as follows: (*a*) Mechanical hyperæmia, and (*b*) Hypostatic congestion.

(*a*) **Mechanical Hyperæmia.**—Also known as **Obstructive Hyperæmia.**—This may, for all practical purposes, be regarded as secondary to disease of the left heart, especially to lesions of the mitral valves with ruptured compensation. The treatment should be directed entirely to the condition of the heart. The hæmorrhages which attend this condition are ofttimes beneficial, as shown by the relief experienced by the patient after raising the blood.

(*b*) **Hypostatic Congestion; Hypostatic Pneumonia.**—Again our treatment must be directed to the primary condition, which in this case is a weak heart or undermined nutrition. The pulmonary hypostasis being favored by the patient's posture, it is of the utmost importance that his position be changed from time to time. Food of as nourishing a character as possible must be prescribed, due care being exercised in view of the nature of the primary lesion. As a rule, the remedies most likely to prove efficient exert an action on general nutrition and the circulation rather than upon the lungs. Those that have been especially recommended are *Arsenic*, *Phosphorus*, *Digitalis*, *Ammonium carb.*, and *Antimonium tartaricum*.

## Emphysema.

Emphysema being a secondary or terminal affection, its treatment must depend in a large measure upon the primary lesion. There exists a fundamental weakness of the lung structure permitting a dilatation of the air vesi-

cles under the influence of either normal or excessive respiratory strain. Treatment demands that we give attention to this fundamental weakness by proper constitutional measures, and the adoption of means to strengthen the tissues, while, at the same time, we remove every possible cause of respiratory strain. Unfortunately, in the treatment of pulmonary emphysema, we have to deal with a vicious circle. The weakened respiration means deficient aëration, this in turn blood possessed of but weak nourishing powers, and finally increased malnutrition of the pulmonary alveoli.

The weakness of the pulmonary structure may be overcome in a measure by attempts at increasing its nutrition by respiratory exercises and general constitutional treatment, the latter including general hygiene and administration of remedies. Unfortunately, the condition of the patient when he applies for treatment is such that ordinary exercises or calisthenics only serve to aggravate the condition. Willcock* has devised an apparatus which he has employed successfully in a number of cases, and which he describes as follows: The apparatus consists of an adjustable jacket. From either side attached in the posterior axillary line are cords which cross to the opposite sides in front, and are here gathered up in a ring. There is a framework consisting of a flat seat, two upright posts, and a cross-bar. To the upright on each side are attached two pulleys. A cord runs over these, at one end of which is a stirrup-shaped handle, at the other a hook. The patient has the jacket adjusted, and sits down, or the seat may be placed under him in bed. The hook on the right side catches up the ring holding the left cords, and *vice versa*. The handles are then grasped, a deep inspiration is taken, at the same time the hands are raised above the head, and the diaphragm relaxed; the jacket then expands.

"When inspiration has reached its maximum, the arms are lowered, and the handles forcibly drawn down. This causes the jacket to contract and compress the chest. The jacket is at the same time drawn up and a deep expiratory effort made. When the arms are raised inspiration reaches its utmost capacity. All the inspiratory and extra-inspiratory muscles, together with the diaphragm, are brought into play. When lowered the chest is compressed, and all the expiratory and extra-expiratory muscles exert their full influence." "By these movements we may gain by compression for loss of tissue; prolonged vitality of remaining tissue; and also development."

Harry Campbell † has suggested respiratory exercises, which, however, are only likely to be successful when the emphysema has been recognized very early in its course. This means usually that the condition has been accidentally discovered by the physician in the course of an examination for some other illness. He names as his indications the preservation of the

* *The British Medical Journal*, Nov. 4, 1899.

† *Respiratory Exercises in the Treatment of Diseases*, p. 7 and 181.

elasticity of the lungs and cartilages, for which the general rules of hygiene to be stated hereafter are efficient; the prevention of the overaction of the costal elevators, and the maintenance of the normal mobility of the chest. To prevent overaction of the inspiratory muscles, the exercises to be advised are of the simplest possible, consisting, as they do, of the deepest possible expiration. The movements are started with the chest in the position of normal inspiration, the patient expiring as completely as possible with his mouth wide open. It is well to do this with the body well bent forward, as this position favors compression of the diaphragm from below. These exercises should be practiced for one-half hour twice daily. It is important also to develop the abdominal muscles, which may be done by having the patient lie on his back. The legs are fixed, and the trunk is then raised to the sitting posture. This exercise developes the depressors of the thorax. Retraction of the abdomen is practiced, as it exercises the transversalis and prevents undue opening out of the costal arch. He also gives directions for increasing the respiratory range as follows: "The patient should lie supine on a form or narrow couch. If neither of these is available, a table or bed should be substituted.*

"1. The operator stands behind the patient's head, which should project slightly beyond the couch; the upper arms are then grasped by the assistant, his thumbs looking upwards; the arms are then brought above the head, so as to form a 'Y' with the body, and strong traction made upon them, the patient meanwhile taking a deep inspiration. They are then brought towards the thorax and firmly pressed against it, while the patient takes a deep inspiration.

"2. The operator stands at the side of the patient and grasps the arms as they rest at each side of the body, just above the elbows, his thumbs being uppermost, and looking towards the patient. He then moves the limbs in a horizontal plane until the hands meet beyond the head of the patient, who meanwhile takes a deep inspiration. This is followed by a deep expiration, while the arms are moved back to their original position, the elbows being firmly pressed against the sides.

"3. The patient's upper arms are held parallel with the body, the forearms crossing over the chest. The assistant stands on a level with the patient's hips, and, grasping the arms just below the elbow (his thumbs looking towards the ulnar bones), raises them in this crossed position beyond the head of the patient, who meanwhile takes a deep inspiration. A deep expiration follows, the arms being returned to the original position, the assistant making firm pressure upon the thorax. In this exercise the arms can be returned to and pressure made upon (*a*) the upper part of the sternum; (*b*) the lower part of the sternum; (*c*) the epigastrium, according as we wish to increase expiration in one or the other region.

* *Op. cit.*, p. 157.

"4. The arms are held supine, at right angles to the body, and are allowed to fall backwards. The assistant stands on a level with the patient's lower thorax, and grasping the limbs above the wrist (his thumbs being upwards, and looking towards the patient's head), presses them back as far as they will go without causing pain, the patient deeply inspiring the while. They are then brought in a folded position across the upper sternum, lower sternum, or epigastrium, against which firm pressure is made while the patient takes a deep expiration.

"5. The assistant rests the palms of his hands on either side of the lower sternum, the fingers pointing towards the axillæ; he then bears his weight upon the patient with every expiration, the degree of pressure being regulated by the needs of the case. If considerable pressure be desirable he may bear his whole weight.

"6. The thorax may also be compressed by means of a broad belt or stays, which can be tightened up with every expiration. External compression of the lower chest, however, is not often required in the woman; the lower chest generally gets too much of it in her case.

"7. The operator stands at the side of the patient, level with the abdomen, and resting the palms of the hands across the belly makes firm pressure upon it with every abdominal expiration.

"8. The patient lies on one side, with the arms held above the head, and the operator, standing behind, places the palm of each hand over the uppermost part of the thorax, so that the roots of the fingers correspond with the axillary line, the thumbs pointing towards the spine. The side of the thorax is thus grasped between the fingers and thumbs. With every expiration the operator makes firm pressure on the thorax and endeavors to make the fingers and thumbs meet.

"The same with the patient lying on the other side.

"9. The patient assumes the same position as in 8. The assistant places his hands longitudinally to the patient, one in front of and the other behind the upper half of the thorax, the fingers pointing towards the head. With every expiration firm pressure is made so as to bring the hands nearer to each other.

"The same with the patient lying on the other side.

"10. Position as in 8. The assistant places one hand across the belly and the other across the back, firm pressure being made with every abdominal expiration.

"11. Position as in 8. The assistant places one hand on the uppermost side of the lower thorax, the fingers pointing towards the sternum, and the thumb towards the spine. The other hand is placed on the uppermost shoulder, the fingers resting on the clavicle and the thumb on the scapula. With every expiration the one hand presses against the lower

thorax, while the other firmly presses the shoulder down, each hand squeezing the chest between the fingers and thumbs as much as possible.

"The same with the other side.

"12. Another means of increasing the expiratory range is to apply pressure on the shoulders with every expiration, the patient sitting."

Numerous authors have quoted with quasi-approval the recommendations of Waldenburg, to the effect that the patient be made by means of a special apparatus to inspire moderately compressed air, and expire into air at a normal pressure. Accurate investigations by those best qualified to judge show that the treatment is practically worthless, whatever benefit accruing from it being due, as Hoffman * suggests, to suggestion and the respiratory exercises.

Much better results have been attained by the pneumatic cabinet, the patient being treated by compressed air. The treatment requires discretion in its application. The patient being placed in the cabinet, the pressure is gradually raised about a pound at a time until at the end of half-an-hour it is increased to seven pounds. It is then maintained at this point for one hour. At the end of that time it is carefully lowered until a half-hour more has elapsed, when the normal pressure is reached. The very gradual increase and decrease of the atmospheric pressure is a most important detail of the treatment, as the neglect of this point may do the patient much harm. Not only does the patient experience relief at the time of the treatment, but for several hours afterwards. Several theories have been propounded to explain the good results, but none of them is satisfactory. It is regarded as especially applicable to the cardiac forms of emphysema associated with hyperæmia of the bronchial walls. It should not be tried in patients with rigid thoracic walls, or in those with advanced arterio-sclerosis. Moderate arterio-sclerosis need not be regarded as a contra-indication.

Oxygen is highly praised by Michaellis † in those cases in which the general appearance of the patient shows deficient aëration. He declares that a complete change comes over the patient after the inhalation of about twenty liters. It is not known, however, whether the oxygen brings any permanent relief.

Emphysematous patients must be forbidden to pursue any occupation which throws undue stress on the respiratory apparatus. Hence it is they must not undertake arduous physical labor involving muscular strain, singing, public speaking, or performing on wind instruments. Special attention must be paid to the bowels, for in case of habitual constipation frequent straining at stool must have a bad effect on the pulmonary condition.

The dietetic problem is a complicated one. The indication to be ful-

* *Disease of the Bronchi, Pleura and Lungs*, Nothnagel's *Encyclopædia*, p. 341.

† *Zeitschr. f. Dietetische u. Physikalische Therapie*, vol. iv, No. 2.

filled is the highest possible nutrition, by means of which the pulmonary degeneration will be retarded in its progressive course as much as possible. On the other hand, we have to deal with a condition which is not infrequently attended by a venous congestion of the stomach and intestines; this, in turn, producing a gastro-intestinal catarrh. It is evident, therefore, that the patient must practice moderation in the pleasures of the table, partaking of sufficient to nourish him and no more. Alcohol and tobacco must be prohibited *in toto*. Cod liver oil as an easily digested fat is to be especially recommended.

There can be no set rules respecting the clothing of an emphysematous patient. As a general rule, it is wise to wear flannel or woolen garments next the skin, excepting in the warmer months. The linen-mesh underwear is to be recommended for careful consideration. Many patients who catch repeated colds with other garments are relatively immune during its use.

As the majority of cases of emphysema are attended by chronic bronchitis, asthma, or heart disease, agencies which are liable to aggravate these several conditions must be studiously avoided. Exposure which may bring on an intercurrent acute bronchial catarrh must be guarded against. To fulfil this latter indication the patient must not be coddled; on the contrary, he must submit himself to a gradual process of hardening by hydrotherapeutic measures.

The emphysematous patient thrives best in a warm moist or a warm dry climate. It is sometimes advisable to advise a change from one of these to the other. High altitudes and a cold moist climate must be avoided whenever possible. In the selection of an abode a dusty atmosphere must be avoided; hence, the patient should not live on streets where travel is active or near main roads in the country.

While we have no remedies which may be regarded as adapted to emphysema *per se*, we should not go to the extreme of assuming that medicines are useless in this condition, for benefit may be derived from drugs belonging to the following classes:

1. The homœopathic tissue reconstructives, as *Calcarea carb.*, *Calcarea phos.*, *Calcarea fluorica*, *Fluoric acid*, *Silicea*, *Phosphorus*, *Aurum mur.*, *Kali hyd.*, *Lycopodium*, *Arsenic* and *Strontium iodide*.

2. Remedies suited to bronchitis and asthma, as *Antimonium tart.*, *Antimonium ars.*, *Antimonium iod.*, *Grindelia robusta*, *Lobelia inflata*, *Ipecacuanha*, *Kali bichromicum*, and *Atropia*.

3. Circulatory remedies, as *Digitalis*, *Sparteine sulph.*, *Agaricine*, *Strychnia*, *Strophanthus*, *Amyl nitrite*, *Glonoin*, and *Sodium nitrite*.

4. Medicines which exert a favorable influence upon the digestive apparatus, as *Nux vomica*, *Argentum nitricum*, *Bismuth subgallate*, *Bismuth subnitrate*, *Beta-naphthol Bismuth* (*Orphol*), *Carbo veg.* and *Cuprum arsenicosum*.

The remedies of the first class are indicated almost entirely upon general principles. Thus, Gatchell * states them to be as follows:

*Calcarea carb.* (6x). Emphysema in fat subjects; chronic bronchitis is prominent, much perspiration, and profuse menstruation in females.

*Calcarea phos.* (2x), on the other hand, suits subjects of arterio-sclerosis in advanced life.

*Phosphorus* (2x). Subjects of fatty degeneration of tissues.

*Aurum mur.* (3x). Nervous subjects with urine of low specific gravity and arterio-sclerosis.

*Arsenicum iod.* is recommended by Blackwood † in cases where there are signs of senile degeneration, as indicated by the hardened arteries, the general senile condition of the patient, and the suffering heart.

The indications of the remedies adapted to bronchitis and asthma have already been given in the sections devoted to the treatment of these maladies (*vide* p. 558).

Many cases require, for a time at least, that the entire medication be devoted to the heart and arteries. The drugs most frequently applicable are Digitalis and Strychnia. Concerning the use of Digitalis and other heart tonics, the reader is referred to the section on the therapeutics of the heart.

When Strychnia is demanded in emphysema it must be given in large doses. It acts not only upon the heart but also as a stimulant of the respiratory centres. Beginning with small doses, say of one sixtieth of a grain three times daily, the quantity may be gradually increased until the patient is taking as much as one-twelfth of a grain three times daily. Wood ‡ especially commends this method of using Strychnia.

*Kali hydriodicum* probably owes its beneficial effect in emphysema to its influence over arterio-sclerotic processes. Care must be exercised in its use, as it may produce excessive bronchial secretion, which is always undesirable. The same remark applies to Strontium iodide. These iodides should be administered in from three to five grain doses three times daily after meals and well diluted.

*Arsenic* is to be administered in cases which exhibit after exposure to cold wheezing on the chest, difficulty in breathing on slight exertion or at night; the patient is obliged to be propped up in bed. It is not of much service when the emphysema is associated with a high grade of bronchitis.

*Quebracho* and *Coca* are highly praised by Hale § for the relief of the dyspnœa. He uses the Coca in drachm doses of the tincture, and claims that by its use the patient is enabled to walk faster than before, and can ascend grades with comfort. The Quebracho is prescribed in doses ranging

* *Medical Era*, 1902. Also, *Diseases of the Chest*, p. 60. † *Diseases of the Lungs*, p. 99.
‡ Wood and Fitz, *Practice of Medicine*, p. 740. § *Practice of Medicine*, p. 352.

from ten to fifteen drops. Hale says that in some cases it is far more efficient than the Coca. There is one serious objection to be made to drugs which lessen the dyspnœa without improving the heart, in that they lead the patient to undertake exertion to which they are not fitted. For senile emphysema, the same authority recommends Lobelia in ten drop doses of the tincture. Sometimes he combines the Lobelia with Coca in the proportion of ten drops of the former to half ounce of the latter. The dose of the mixture is one drachm. Ringer recommends Lobelia as a palliative of the dyspnœa which accompanies the broncho-pneumonia of emphysematous patients.

When the main difficulty lies in an intense venous congestion with distention of the right heart, which labors under its load, venesection is recommended by numerous authorities. Such cases are, of course, few in number. Hale asserts that *Veratrum viride* has acted in his hands fully as well as the venesection. He administers one to three drops every half-hour until relief is obtained. In urgent cases it should be given hypodermically.

## Atelectasis Pulmonum.

Two forms of atelectasis pulmonum are recognized, namely, the congenital and the acquired.

**Treatment of Congenital Atelectasis.**—The treatment of congenital atelectasis is mostly mechanical. Artificial respiration is to be performed according to the well-recognized rules governing the same. When possible, the acts of crying and coughing are to be encouraged. In fact, if the child does not cry it must be made to do so. This result may be brought about by baths in hot and cold water alternately, or if this is too much trouble, or is unavailable, by spanking. These procedures should be continued twice every day until the little one has learned to cry long and lustily. Preparatory to exercising the respiration, the little one's mouth should be carefully washed to free it of any accumulated secretions, lest they be drawn into the inspiratory tract and produce an aspiration pneumonia. It is a serious mistake to permit infants to sleep too long, or to remain for a great length of time in the same position. The maintenance of the little patient's bodily heat is one of the most important details in his treatment. To this end, the body should be well wrapped in warm flannels or hot-water bottles applied. In extreme cases the incubator should be used when available.

If the patient is unable to take nourishment readily, as is commonly the case, food should be administered by the rectum. To force feeding by the mouth may lead to the escape of the food into the respiratory tract, with all its resulting harm.

After respiration has been fairly well established, the process of cure may be encouraged by massage and the stimulus of fresh air, always bearing in mind the importance of keeping the child warm.

**Treatment of the Acquired Form.**—In the treatment of acquired atelectasis, one must keep in mind the primary disease, for attention must always be directed to this as well as to the local condition. Many of these primary affections are debilitating, as rachitis, diarrhœa, numerous infectious diseases, and acute pulmonary inflammations. It is important, therefore, that the patient's strength be sustained, which may be done by the administration of stimulants and of highly nutritious liquid foods. Cases of atelectasis dependent upon the occlusion of a bronchus by pressure of a tumor are necessarily incurable by any treatment. If the pulmonary collapse is due to pressure of pleural effusion or ascitic fluid, these must be removed at once.

A physiological circumscribed atelectasis has been described. It occurs in young subjects who, so far as can be ascertained, are otherwise healthy. It can always be made to disappear after the patient has taken a few deep inhalations.

The medicinal management of acquired atelectasis is that of the primary disease.

Von Hoffman* believes that much of the benefit to be derived from cold bathing in fevers is due to the efficacy of the measures in combating atelectasis.

## Abscess of the Lung.

The diagnosis and localization of the lesion is the first and most difficult step in the treatment of pulmonary abscess. I am aware that there are those who think differently, regarding as they do the infallibility of physical signs. But when one bears in mind that the abscess is not infrequently surrounded by pulmonary consolidation, or its contained pus so well retained as to give all the evidences of consolidation pure and simple, the difficulties become apparent. In every case the rational symptoms must be utilized as a guide to the recognition of suppuration and the progress of the lesion.

Whenever possible, the suspected side of the chest should be examined by the X-ray. The information given by it should, in the majority of cases, be infallible.

At the best, the results of operation for pulmonary abscess are unsatisfactory. Occasionally, one meets with a surgeon who reports unusual results. Thus, Cavazzani† treated eleven cases by drainage and lost three. It is of the greatest importance that the cases for surgical intervention be carefully individualized. It is well known that some cases recover spontaneously. Under this class are to be considered those in which the abscess has opened into a large bronchus and free drainage has been established; cases occurring in young subjects, because of the elasticity of their thoracic

* *Diseases of the Bronchi, Lungs and Pleura.* Nothnagel's *Encyclopædia*, p. 379.

† *British Medical Journal*, August 13, 1904.

walls ; apical abscesses, because their location is favorable to natural drainage should they open into a bronchus ; and recent basal abscesses, because they can be more readily emptied by coughing, and the readiness with which the defect may be remedied by granulation and cicatrization.

Abscesses suitable for operation include the post-pneumonic abscesses, which are nearly always single ; abscesses which have opened into a bronchus, but which, after two or more days, are not proceeding satisfactorily ; cases in which the discharge is distinctly purulent.

Cases which are inoperable include those of metastatic and embolic origin, as they are practically always multiple ; the abscesses succeeding post-influenzal pneumonia ; for the same reason, abscesses originating in pulmonary gangrene arising from the pressure of a tumor on a bronchus or pulmonary tissue or dependent upon an accumulation of septic material which has entered the lung through the trachea because of "cut-throat" or tracheotomy.

Abscesses due to the entrance of a foreign body do better without operation, as their tendency is to heal spontaneously when the foreign body is expectorated ; and operation though evacuating the abscess does not always rid the thorax of the offending substance.

When pulmonary abscesses has been diagnosed, and an operation regarded as necessary, there should always be a preliminary puncture. If the aspirator needle fails to discover the situation of the pus, and there are good reasons for persisting in the exploration, the needle should be partially withdrawn and introduced in another direction. By this means, multiple puncture of the pleura—an important desideratum—is avoided. If pus is found, the cavity may be emptied before the patient is anæsthetized for the radical operation. If exploration is negative, the operation should be abandoned. Puncture with the aspirator needle should not be looked upon as an innocent operation, for when adhesions are absent—which, fortunately, is only in the minority of cases—there is danger of infecting the pleura.

The dangers of operation lie in the possibility of aspirating septic materials into healthy portions of the lungs, thus spreading infection ; or of suffocation by the discharge of a large quantity of pus ejected by coughing during anæsthesia. The latter danger is lessened by the preliminary evacuation of the abscess through the aspirator needle.

The dangers of operation are found in the difficulties arising from failure of respiration by reason of the posture in which the patient may be placed ; the extension of the pneumonia ; septic infection ; and hæmorrhage.

Pending the decision as to operation, and in non-suitable cases, the treatment must be supporting and medicinal. The diet must necessarily be as nutritious as the circumstances of the case will permit. Unfortunately,

the practitioner is greatly handicapped in this particular, because in the presence of a suppurative fever and high grade of asthenia, such as exists in conjunction with pulmonary abscess, the patient's digestive and absorptive powers are poor. In the majority of cases, then, liquid diet is about all that can be given with advantage. Its action may be enhanced by the administration of alcoholic beverages, especially whisky and brandy. The possibility of doing any good by antiseptic inhalations is very remote, as the medicament does not reach the seat of disease, and even though it did, it could do no good unless the purulent accumulation is removed. Palliatives for the cough are worse than useless; they do positive harm. The salvation of the patient lies in the removal of the accumulations, and nature's method of effecting this lies in the cough.

The remedies indicated include those which have a special relationship to suppuration, including *Hepar sulphur*, *Silicea*, and *Mercurius*. The septic asthenia calls for *Arsenicum*, *Chininum arsenicosum*, *Arsenicum iod.*, *Cinchona*, and *Lachesis*.

### Pneumonokoniosis.

The pathological lesions of pneumonokoniosis consisting of chronic bronchitis, emphysema, pulmonary fibrosis, cavity formation, and even superadded tubercular infection, the therapeutic problem is not a simple one. In a general way, the treatment of these cases involves attention to the principles inculcated in the sections devoted to the therapeutics of the above-mentioned affections. So far as pneumonokoniosis itself is concerned, the disease being incurable when symptoms have once developed, all of our recommendations must relate to the very important question of prophylaxis.

We naturally advise that patients shall not select occupations exposing them to dust; but this advice will not be heeded, for occupation is more frequently the result of accident than choice. Again, we can seldom induce a patient to give up a trade which he has learned, because, as a rule, he is unfitted for any other, and he must make a living.

The occupations which are regarded as extra-hazardous because of dust include the following: Coal mining, steel and iron industries, stonecutting, plastering, brickmaking, diamond-grinding and polishing, porcelain, pottery, china working, cotton, wool, and silk manufactures, tobacco workers, and millers.

The prophylaxis which the followers of these occupations should adopt may be considered under two classes, namely, the personal, which must be attended to by the artisans themselves, and the special measures to be adopted by the owners of the business looking to the protection of their employees.

The regular use of respirators by the employees would, most assuredly, settle the whole question of prophylaxis; but experience has

taught us that the inconvenience arising from their use is regarded by them as sufficiently great as to lead them to brave the dangers of dust inhalation.

Price * has epitomized the general measures to be adopted in factories looking to the protection of employees from dust as follows :

1. Separation from all other processes of those in which dust abounds.
2. Substitution of machinery for handwork whenever this is possible.
3. Substitution of wet for dry processes of production.
4. Instant and continuous removal of dust by special ventilators.
5. Isolation of the worker from the dusty process.
6. Frequent change of air and frequent pauses.

The author then goes into detailed description of the means by which these various results may be attained.

## Gangrene of the Lungs.

While the mortality of gangrene of the lungs is high, a review of the literature shows that the results are better than is commonly believed. Undoubtedly, nearly all cases of the diffuse form terminate fatally. Of the circumscribed cases, the mortality is about 92 per cent. under medical treatment, and but 25 per cent. when surgieal measures have been adopted. As in the case of pulmonary abscess, a correct pathological and topographical diagnosis is a prerequisite to success. Greater accuracy in this desideratum is obtainable by the use of the X-ray in addition to the information afforded by the physical signs. When these agree the physician finds himself greatly fortified in his position. When they disagree, it is now regarded as the part of wisdom to accept the X-ray findings, ignoring those of the physical examination. The necessity for surgical interference depends upon numerous factors. In cases of gangrene of the apex the danger is especially great, and early operation becomes imperative. When the pathological process is diffuse, or when there are several foci, an operation is positively contra-indicated. Cases in which no pleural adhesions exist offer an unfavorable prognosis, but are not to be regarded as inoperable, if other conditions are favorable. When fever continues high, and the patient is being prostrated by the rapidly increasing sepsis, especially if the fever is associated with or preceded by chills, operation must be attempted whenever the examination shows the lesion to be so situated as to be reached by the knife. The presence of an empyema makes operation all the more imperative, and satisfactory results more likely. A danger inherent to the operation lies in hæmorrhage, which occurred in 9 cases out of 74 studied by Tuffier.

Antiseptic inhalations are recommended by all authorities ; but their function, so far as can be seen, lies in lessening the odor of the sick-room than in bringing relief to the patient. As this result does much to lighten

* *Reference Handbook of the Medical Sciences*, vol. vi, p. 328.

the woes of the family it should not be ignored. The inhalation which has most to commend it is Carbolic acid in 4 to 5 per cent. solution, which is reduced by one-half by the steam in the spray apparatus. If, in the localized cases, life can be prolonged until the necrotic tissue can be cast off, there is a strong possibility of a good result. To this end, the patient's strength should be conserved as much as possible, and this may be done by the administration of easily assimilated and nutritious foods, as rich broths, milk, cream, etc., at short intervals. Stimulation by whisky or brandy may always be regarded as necessary.

Medicines occupy a subordinate position in the treatment of pulmonary gangrene. Those which have been recommended are *Arsenicum*, *Lachesis*, *Carbo veg.*, *China*, *Camphor*, and *Creosote*.

### Tumors of the Lungs; Carcinoma; Echinococcus, Etc.

Carcinoma of the lungs is commonly secondary to malignant growths elsewhere, especially in the mammary glands. It is seldom, indeed, that the disease is recognized sufficiently early with a certainty to justify surgical removal. The operation under the best of circumstances is highly dangerous, and the ultimate results in the cases that recover must be very problematical. It is, therefore, necessary for us to depend upon palliative and symptomatic medical measures to make the patient as comfortable as possible throughout his fatal illness. The special measures requiring consideration include the exhaustion, pain, and cough.

Echinococcus cysts, when correctly diagnosed and located, offer considerable prospects of success from surgical interference. Although the mortality of the operation is high, it must be remembered that hydatid disease runs an inevitably fatal course.

### Pleurisy.

The general management of pleurisy relates mainly to the employment of the great therapeutic trinity, namely, rest, fresh air, and judicious feeding.

With the advent of the fever the patient must be put to bed, and kept there until several days after the subsidence of fever and pain in the so-called "dry cases," and in those with effusion until a reasonable amount of the exudate has been absorbed. The patient may be permitted to assume the position from which he derives the greatest comfort.

As much of the pain is dependent upon motion of the chest walls, it may be inhibited in great measure by strapping the chest. This is usually accomplished best by the application of adhesive strips. These should consist of strips of plaster three inches wide, and in length four inches longer than is necessary to encircle the affected side. This length arranges for an overlapping of the sound side by two inches front and back. They should be applied while the chest is in the position of expiration, and

should take the direction of the ribs. Each strip should slightly overlap the preceding one applied. Rest for the chest may also be secured by bandaging or the application of a binder. As a rule, this method is not as efficient as strapping. The latter, in the vast majority of cases, so efficiently removes pain as to do away with the necessity of local or internal analgesic remedies.

The diet during the febrile stage of the disease should be such as is indicated in febrile affections generally, namely, liquid and nutritious. Milk, broths, and raw eggs constitute the staple articles. During the stage of effusion, and after all active inflammatory symptoms have subsided, different views prevail. The great majority of clinicians advocate a nutritious, easily digested mixed diet. It has also been suggested that the articles selected have as little bulk as possible. Others, and these are relatively few, contend for a dry diet. While there can be no doubt concerning the ability of this plan in limiting the effusion or promoting its absorption, experience has taught that very few patients will tolerate the discomfort and even suffering that ensues after it has been continued for a few days. Some have even gone to the extreme of advising the free use of salt and forbidding the use of water. Such a plan certainly will not be tolerated by many patients.* Of late, the salt free diet has been proposed to promote absorption of the exudate. Against this there are no objections to urge beyond the fact that the food taken is not as palatable as patients would like.

Local treatment of the chest exerts little or no influence over the inflammatory process. Blisters and plasters do little or nothing in the way of cure and relieving pain. If any local application is required it should be a hot poultice, as of flaxseed or antiphlogistin.

If pain fails to yield to strapping, we may resort to one of two remedies, Morphia or Guaiacol. The former should be given hypodermatically in doses ranging from one-eighth to one-quarter of a grain, and should be repeated as infrequently as possible. The latter is to be applied to the affected side of the chest or to the painful area in 50 per cent. mixture with glycerin. It is best painted on with a camel's-hair brush, after which the parts are covered with a lint dressing and oiled silk.

Throughout the course of the illness the greatest attention must be paid to the ventilation of the sick-room. When the out-door temperature will permit the windows should be kept open and the patient screened from drafts.

Ice-bags have been recommended by a few, but their use is strongly condemned by the majority of those having experience in the treatment of pleurisy.

* Those interested in the "dry diet" in the treatment of pleurisy with effusion will find all the details in connection with same in Thompson's work on *Dietetics*, 2nd edition, p. 482.

The medicines adapted to the treatment of pleurisy are few in number but very efficient. Very seldom, indeed, will one be obliged to go outside Aconite, Bryonia, Cantharis, Arsenicum, Kali carb., Apis, and Sulphur. Indeed, the indications afforded by the majority of cases will be met by the first three remedies mentioned,

*Aconitum napellus* is limited in its curative effects to the earliest stage of the disease, when the disease starts in with a chill or chilly sensations, followed by fever in association with restlessness and dry hot skin, thirst, rapid respirations, dry cough, and stitching pains in the chest.

*Bryonia alba* will be proven useful in any stage of the disease up to the subsidence of active inflammatory symptoms. While undoubtedly a specific for the ordinary dry or plastic pleurisy, its utility does not cease with the appearance of effusion, as stated by some of our most eminent authorities. It is also efficacious in the pleurisies—usually "dry"—attendant upon tuberculosis and pneumonia. *Kali carb.* is also to be considered a remedy in such cases. The symptoms calling for Bryonia include sharp stitching pains in the chest, aggravated by any motion or by respiration, dry cough, sensitiveness to pressure over the affected part of the chest, relief from lying on the affected side. Fever is present and occasionally severe, but is attended by sweat. It is the remedy generally required in cases of diaphragmatic pleurisy.

*Cantharis* is regarded by Goodno* as the most efficient remedy when effusion has taken place. He looks upon the dosage as very important, recommending a solution of ten drops of the tincture in four fluid ounces of water, of which one teaspoonful should be given every one to three hours. The special indications for Cantharis are sensations of heat and burning in the chest, urinary irritation, dyspnœa, cardiac palpitation, syncopal seizures, and great weakness of respiratory organs displayed on attempting to speak. The fever is, as a rule, not a marked feature of the Cantharis case. Cantharides is used by the old-school as a blister, applied below the axilla or over the maximum seat of pain, with the idea of promoting absorption of the effusion. So far as I can see, most of their authorities do not place very much reliance upon its virtues.

*Arsenicum* is the most important remedy in the asthenic cases of pleurisy. Respiration is painfully embarrassed; prostration is profound; great restlessness; insomnia; cachectic appearance; diarrhœa; cyanosis.

*Apis mellifica* is strictly a remedy for cases in which effusion is great and resistant to treatment, the case still being in its acute stage. Fever is moderate. The face is pale and may be œdematous, and the urine is scanty. Pain, if present, is of a burning character. Lilienthal mentions this remedy as one of those useful in chronic and latent cases.

* *Practice of Medicine*, vol. ii, p. 321.

*Sulphur* is to be prescribed in cases in which the effusion is persistent, the patient remaining otherwise comfortable. Opinions as to the time for giving this remedy must necessarily differ with the personality of the physician. At the best, the absorption of pleuritic effusion is a slow process, and one should be thoroughly satisfied that the processes of recovery are lagging before he abandons the better-tried remedies.

*Kali hydriodicum* is very largely used by both schools of medicine as an absorbent remedy without special indicating symptoms. It should be given in moderate doses of the crude drug, *i. e.*, five grains well diluted, three times daily. *Iodine* is also favored by some homœopathists in the class of cases for which Sulphur has been already suggested.

Among the remedies uncommonly indicated in pleurisy may be mentioned *Colchicum*, *Rhus tox.*, *Asclepias*, *Mercurius cor.*, *Phosphorus*, *Scilla*, *Veratrum viride*, *Gelsemium*, and *Macrotys*.

*Colchicum* or *Colchicine* is called for purely on etiological conditions, having been recommended by Goodno in cases occurring in rheumatic or gouty subjects. He exhibits a preference for the third decimal trituration tablets of the alkaloid, given every one to two hours.

*Rhus tox.* is also adapted to the rheumatic cases, especially, however, in those in which the disease has originated after exposure to damp or cold, or being chilled or wet while heated and perspiring. There are pains with restlessness, the changes in position affording relief. This remedy is also recommended by the eclectics, as are also Aconite, Bryonia, Asclepias, and Macrotys.

*Asclepias tuberosa* was a remedy first in vogue among the country people, hence its common name of "pleurisy root." Provings of it give a good picture of a mild pleurisy. Hale* calls it a lesser Bryonia. It is a special favorite with the electics, who advise it when "the pain is erratic, the skin dry, and the tissues tense." It is given as follows: "One to two drachms of the tincture to half a cup of hot water, a teaspoonful every thirty to sixty minutes for several doses." †

*Mercurius corrosivus* is the most efficient remedy in the pleurisies complicating chronic nephritis. *Arsenicum* and *Cantharis* may also be indicated under these conditions.

*Phosphorus* is an important remedy in cases of pleurisy associated with or complicating pneumonic fever; nevertheless, it must remain subordinate to Bryonia in such a condition. *Veratrum viride* and *Gelsemium*, both recommended by old-school authorities as having a place in the therapeusis of pleurisy, are better adapted to cases of pneumonic fever, in which pleuritic manifestations are unduly prominent. As to pleurisy *per se* they are of but little value.

*Scilla* has been placed by Hale ‡ as superior to Cantharis and second

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* *Practice of Medicine*, p. 356. † Thomas, *Practice of Medicine*, p. 361. ‡ *Ibid.*, p. 358.

only to Bryonia as a remedy in pleurisy. He makes the special indications to be pleurisies of children; pleurisy attended by capillary bronchitis; serous effusion which forms very rapidly; kidneys non-active; difficult or embarrassed respiration; stitching pains in various portions of the chest; dry cough, especially in the morning.

Diuretic and diaphoretic remedies to promote absorption of the exudate are now regarded as useless by all prominent authorities. Certainly, there is nothing in the pathology of pleurisy to lead us to believe that the physiological action of these remedies is such as to produce the desired result.

Of the old-school remedies, but one seems at present to have any favor, namely, *Sodium salicylate*. The evidence in its favor is not strong. It hardly seems likely that it can be capable of benefiting any cases other than those of purely rheumatic origin. It certainly does not influence tubercular processes of the pleura or other structures of the body.

**Paracentesis.**—Every therapeutist is agreed that there are cases of pleurisy with effusion in which tapping is required, or at least benefit is to be derived from the operation. But just as surely there are differences as to the frequency with which such operative interference is demanded. At the present day, paracentesis has become so popular that it is now a difficult matter to obtain a long series of cases from which to draw deductions as to the value of medicinal and hygienic measures pure and simple. We must, therefore, for comparative purposes make use of data of rather ancient date. Louis treated 229 cases of pleural effusion, of which but one died, and that from a complicating pericarditis. Walsh, another old authority on diseases of the chest, published a similar series. This represents one extreme of the question. On the other side, we have the recently published experience of Delafield,* who treated 200 cases. Of these 182 were cured; 6 left the hospital early and probably recovered; 6 left before recovery and the results must be classed as uncertain, and 6 were not benefited. In his concluding remarks, Delafield says: "In private practice, the results are better than in the hospital. In the fortunate cases, within twenty-four hours after one aspiration, there is no more fluid and no more pleurisy. In a large number of cases the pleurisy is cured within a week, and none of them ought to be sick longer than two weeks." Between these extreme views the conservative physician will take a stand. He will individualize his cases, and resort to tapping when the indications are such as to suggest that that measure will benefit the patient.

**Paracentesis is necessary,** indeed, it may be classed as urgent, under certain circumstances. These in a general way may be stated as large effusions and severity of symptoms arising from the pressure of the

* *American Journal of the Medical Sciences*, vol cxxiv, pp. 947–8.

same. The symptoms, however, are not always dependent upon the quantity of fluid present; rapidity of formation is ofttimes more important than quantity, because the individual has not had the opportunity of adapting himself to his new respiratory conditions. The pathological lesions associated with the pleural inflammation have much to do with the severity of the clinical phenomena, *e. g.*, pleurisy associated with or dependent upon tuberculosis or pneumonic fever and bilateral effusion are liable to present well-defined pressure symptoms in the presence of relatively small effusions.

**Paracentesis is advisable** in some cases for the simple purpose of accelerating recovery. The patient's life is not in danger, and his ultimate recovery is certain. But when the effusion is large, as it often is, a removal of the fluid shortens convalescence by many weeks. Indeed, the patient may be able to go about in the course of three or four days. Another point to be remembered in connection with large pleural effusions is that it occasionally happens that symptoms of serious character appear when least expected, thus making the "advisable" case an "urgent" one.

**Cases in which opinions will differ** are those of moderate effusion which will almost certainly disappear spontaneously in time. The physician will shape his course in their management according to his predilections for paracentesis. A good rule to follow in handling this class of cases is to wait for two or three weeks and note the progress made. If it is not satisfactory, paracentesis should be performed.

The arguments that have been advanced in favor of early tapping are based very largely upon theory rather than upon practice. It is very difficult, indeed, to reach positive conclusions from the clinical experience at our disposal. Let us take Delafield's report as an example. The most that can be said of it is that paracentesis is unquestionably valuable in a very large proportion of cases of pleurisy. Undoubtedy, it is more than a palliative operation; as Trousseau once said, it is often a true curative agency.

Having admitted that paracentesis is invaluable, if not a necessity in many cases of pleurisy with effusion, the next question is the determination of the stage of the disease at which it should be performed. Some say "Tap at once." This is too radical. It is almost certainly unwise to operate during the febrile stage, for the inflammation is still going on. It is better by far to wait at least two weeks, and possibly three, in the absence of definite indicating symptoms, before resorting to it. Against early tapping may be urged a theoretical consideration, which may after all be practical. The emptying of the pleural sac must permit the inflamed surfaces to come together, and their friction against each other is liable to increase any remaining inflammatory condition. On the other hand, those who advocate early tapping assert that tapping puts an end to the disease

at once—a broad statement that still lacks confirmation. It is a matter of opinion only. Again, they say the longer the compression of the lung by the effusion is continued the more likely it is to be bound down by adhesions and its subsequent re-expansion prevented. This assertion has not been proven by experience. Extreme cases have been recorded in which the lung has been compressed for periods of nine and eighteen months respectively, and yet perfect re-expansion has been attained. Of course, I am not advocating such unjustifiable delays as these. They only go to show nature's restorative powers under long existing adverse conditions. An investigation into cases as commonly observed shows that the adhesions formed in comparatively recent pleurisies are so unresistant as to offer but little impediment to complete restoration.

Safe though paracentesis be, it, like all other operations, however slight, must be associated with a certain amount of risk, dependent in the main upon unavoidable accidents. Then, too, we have the chance of infection, which, despite carefully-devised antiseptic precautions, may supervene. Thus, a simple sero-fibrinous pleurisy is converted into an empyema.

**The contra-indications to paracentesis** are practically *nil*. The continuance of fever is most assuredly a contra-indication just so long as there is no urgency of symptoms and no longer. Some would even deny this. Still, the operation is perfectly safe during the febrile stage. The operator must not expect the temperature to be modified, for such very rarely takes place.

The association of pulmonary tuberculosis, which is held to be a contra-indication by some clinicians, is not much of a deterrent. The argument has been made that the long-continued compression of the lung is curative as regards the tuberculosis. Experience has not proven this bold statement. On the other hand, it has many times happened that pleurisy with effusion in the course of pulmonary tuberculosis has been treated by paracentesis with most happy results.

The fear that a sero-fibrinous effusion may become purulent is justifiable, though such an occurrence is very unlikely if every antiseptic precaution to be detailed hereafter is enforced. Infection may take place from within, but that is unavoidable, and would probably have occurred had no operative interference been made.

**To Perform Paracentesis Thoracis.**—The physician should make it a routine practice to precede the paracentesis by an exploratory puncture with a hypodermic syringe carrying a long and comparatively coarse needle.

A general anæsthetic is unwise, for it is not needed, and if used we are deprived of the valuable assistance given us by the patient's sensations as to the proper time to discontinue the withdrawal of fluid. Local anæsthesia is always admissible. Of these we have quite a choice. Applications of pure carbolic acid or methyl chloride over the proposed site of

puncture are deservedly the most popular. Another simple expedient is the application of a pointed lump of ice for two or three minutes preceding the operation. Hypodermic injection of a 4 per cent. solution of cocaine is very efficient, but is open to the objection of possible undesirable effects from that drug.

A small trocar and canula are the only instruments necessary. Some advise the aspirator as less liable to be followed by infection. The latter instrument is rapidly loosing favor, as the suction employed in the removal of the fluid has in a number of instances done damage to the lung. The canula of itself is all-sufficient to withdraw the fluid. The danger of air being drawn into the pleura during an inspiration is practically *nil.* This may be avoided by attaching a small rubber tubing to the outer end of the instrument, while the other end rests in a receptacle containing sterilized salt solution. This scheme gives us the additional advantage of syphonage produced by the 24-inch drop of the tube, *i. e.*, the distance between the seat of operation and the floor. The suction thus engendered is never great enough to endanger the safety of the pulmonary structures, and is sometimes a distinct advantage. The trocar selected should have a diameter of about one-sixteenth of an inch. This size has the advantage of permitting an easy flow of the fluid without allowing a risk of too rapid emptying of the pleural cavity.

**The place selected for puncture** may, in a general way, be stated as the centre of the area of percussion dulness. Another situation is in the fifth to the seventh interspaces in the mid- or post-axillary lines.

**Mode of Operating.**—The patient is placed in a semi-recumbent position in bed, or may be removed to a chair. The former is preferable. His arm is raised so that the hand and forearm are over the head. This position gives the greatest possible width of the intercostal spaces. This is needed, for it is not always an easy matter, excepting in thin subjects, to outline these accurately. The trocar and canula are held in the operator's hand, the shaft of the instrument being steadied by the first finger, the tip of which is so adjusted as to prevent entrance beyond the desired distance. The point of the instrument is placed on the point of puncture, the shaft at an angle of 90° with the surface. A quick, steady thrust is made, and the operation is an accomplished fact. An important difficulty to be avoided is a change in the position of the instrument should the patient make a start or jump as the point penetrates. Care must be observed not to strike the edge of the rib, as this accident may lead to breaking of the point of the trocar and adds considerably to the pain. The danger of wounding the intercostal arteries is very little, although textbooks make much of this danger.

**Quantity to be Removed.**—The general rule governing this point is easily stated. "Remove just as much as possible without interfering with the comfort of the patient." Sixty ounces represent about the amount

evacuated in average cases. Very large amounts have been recorded, the maximum being 250 ounces by Liebermeister.* One should not be too persistent in effecting a removal of all of the fluid, for experience has taught that a partial evacuation of the pleural cavity is very efficient in promoting the absorption of that left behind. If from any cause the canula should become obstructed, care should be observed that the stilet inserted to remove the obstruction is properly sterilized. It is a general rule that effusions which have appeared rapidly may be removed with less danger of discomfort to the patient than those of slow formation.

**Dangers of Paracentesis.**—These are practically *nil.* The one most likely to occur is puncture of the lung. This rarely does any harm if instruments are sterile. A laceration of the lung is a more serious matter, and this, it is generally believed, is far more likely to be dependent upon disease of the tissues of the organ than upon direct traumatism. Undoubtedly, when the aspirator is used too much suction may readily damage the lung.

Inconveniences or symptoms arising during the evacuation of the exudate must be expected and are not to be regarded as dangerous. These include pain, cough, general distress, dyspnœa, and albuminous or serous expectoration.

Pain is a rare concomitant of tapping. It is usually experienced beneath the upper portion of the sternum or clavicle or in the shoulder. It is sometimes quite severe, and may be associated with sense of faintness and irregularity of the pulse. It must always be regarded as an indication for stopping the withdrawal of the fluid, temporarily at least. It is generally regarded as dependent upon the stretching of adhesions. It usually ceases immediately the flow of fluid is stopped; it never continues more than one or two hours after the operation. It may sometimes be advisable to administer an alcoholic stimulant or strap the chest.

Cough is a very common annoyance during the course of a tapping, and frequently demands its discontinuance. It is usually dry and painful, and increases in intensity and frequency as the amount withdrawn increases. If it persists after the operation, it may be quieted by a single dose of Heroin, gr. $\frac{1}{12}$.

Sometimes we may observe a general distress or anxiety, attributed to disturbed cardiac function. This, indeed, is their origin, probably brought about by disturbance of the circulation by the removal of the pleural effusion.

Dyspnœa is very rarely observed. As it may become quite severe and serious, it is wise to stop the operation on its first appearance, however slight it may be.

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* *Deutsch med. Wochenschr.*, 1890, No. 11.

Albuminous or serous expectoration is a peculiar complication, the frequency of which has been greatly over-rated. Its advent is usually preceded by cough with shortness of breath, and soon the expectoration of a clear watery fluid appears. It is seldom that the symptoms appear until after the paracentesis has been finished, the interval elapsing being anywhere from a few minutes to two hours. The attack continues from one hour to two days, and the quantity of fluid expectorated may amount to as much as three pints. The fluid is frothy in appearance, and on standing divides into three layers, an upper, whitish and frothy; a middle, opalescent; and a lower, which is viscid. The physical signs include wheezing and crepitation on the affected side only as a rule. In the majority of cases the termination is favorable. In those that have died, œdema of the lungs has been found.

When in the course of paracentesis the fluid discharged assumes a bloody tinge, the tapping should be suspended at once. When air is found to pass with the fluid we have an indication for stopping the operation, for it is evident that the lung has been perforated. This will do no harm if the lung is healthy, but if a cavity in that organ has been entered the pleural effusion will almost certainly be converted into an empyema.

The paracentesis having been completed, the wound should be closed or sealed by absorbent cotton and collodion. The treatment should be directed to improving the strength and nutrition of the patient. Owing to the frequent association of pleurisy with tuberculosis, it is a wise plan to put the convalescent from pleurisy on open-air treatment for a period of three to six months.

## Hydrothorax.

Hydrothorax is always a secondary condition; hence, its treatment is strictly that of the primary affection, plus any mechanical intervention, *i.e.*, thoracentesis, which may be necessary to relieve the patient of symptoms dependent upon the pressure of the containing fluid. It may be urged that the original lesion, usually ruptured compensation in mitral disease, is of such serious character that little or nothing can be expected by way of results. As a matter of fact, it not infrequently happens that the mechanical reduction of the hydrothorax so relieves the embarrassed circulatory and respiratory apparatus as to make all the difference between suffering and early death on the one hand, and comfort and comparative recovery on the other. It is not expected that the paracentesis under such circumstances shall act as a curative measure; it only serves as a medium by which the treatment of the heart and kidneys can become effective.

It is not always advisable in the case of a hydrothorax to wait for the chest to become fully distended by the effusion, for under the circumstances which exist it is possible for a very small amount of fluid to produce great distress. The removal of this will bring equally great relief.

What has already been said respecting the antiseptic precautions to be adopted in paracentesis for pleurisy with effusion applies with additional force to hydrothorax, because the opportunities for infection in this class of cases are considerable.

Hydrothorax is nearly always the last lesion in progressively increasing dropsy, the parts suffering in order being the lower extremities, the peritoneal cavity (ascites), and the pleural cavities. In case of treatment being successful the recession of the dropsical phenomena takes place in the reverse order of their appearance; hence, the hydrothorax is the first to go. Even when local measures, as the insertion of Southey's tubes, are the cause of the improvement there is recession of the intra-thoracic effusion.

Objection has been made to the practice of thoracentesis in hydrothorax on the ground that repeated tappings are often required, and that the removal of such a large amount of albuminous fluid must necessarily be weakening to the patient. This objection is a valid one; but we are face to face with a condition far more serious, namely, early circulatory and cardiac failure. It is, therefore, better by far to provide against the latter by removing the mechanical impediment as far as possible.

The medical measures are those employed in ruptured compensation and general dropsy. To the articles on these topics the reader is referred.

## Empyema.

So far as the curative treatment of empyema is concerned it is strictly a surgical affection. The operative procedures required may be classed as tentative and radical. Tentative procedure is simple paracentesis. It should be a routine procedure to do this first in the majority of cases, because in a few instances we may be fortunate enough to find that such a simple tapping results in a radical cure. This favorable result is especially likely to occur in children, and in cases arising from pneumococcic infection. It is a wise plan to treat all cases of strictly tubercular empyema by the same procedure, although we can hold out very little hope as to effecting a cure. The reason for this lies in the great danger of the radical operations in cases of this class, almost all of them terminating fatally. In all cases in which the patient's general condition is bad it is advisable, if not absolutely necessary, to treat by paracentesis for the time being, the idea being to utilize the time in improving the patient's nutrition by proper hygienic measures and medicinal treatment, thus making the operative results more certain. *It should be the routine practice of the physician or surgeon to make a preliminary exploratory puncture before resorting to paracentesis* in order to determine with certainty the presence and character and location of the contained fluid. Finding pus, it should, whenever possible, be submitted to a competent bacteriologist for an opinion as to the causative organisms. Such an examination must prove a valuable guide in subsequent treatment and prognosis.

The diet, needless to say, must be nutritious and easily assimilable, including, in the weakest patients, liquid articles, as milk, raw eggs, and good home-made broths. When the state of the digestive organs will permit, solid food of nutritious quality and properly prepared may be ordered.

The remedies to be prescribed are those indicated in chronic suppurative processes, as follows: *Silicea*, *Mercurius*, *Calcarea carb.*, *Calcarea fluorica*, *Fluoric acid*, and *Sulphur*.

## Pneumothorax; Hydropneumothorax; Pyopneumothorax.

Traumatic pneumothorax originating in a punctured wound of the thorax is, when uncomplicated by other injuries, of not much serious moment. The great danger lies in an added septic infection at the time of the injury. Otherwise, it is the rule for the air to be absorbed within an incredibly short space of time. No treatment is required other than attention to the external wound and rest in bed.

When the pneumothorax is the result of a punctured wound of the lung, as from a fractured rib, the state of affairs is quite different from that above related. Air enters the pleural cavity as before, but now, by the repeated acts of respiration, it accumulates more and more, and the lung on the affected side becomes collapsed. The opening in the lung sometimes acts like a valve, and thus the air in the pleura becomes confined under pressure, and we have as complications pressure exerted upon the opposite lung and displacement of the heart. The treatment in this class of cases is paracentesis to let out the confined air. This must be done under every antiseptic precaution. Some authorities recommend that the canula be permitted to remain *in situ* until such time has elapsed as to make it certain that air is no longer accumulating. If this is done, the canula should have attached to its outer end a long rubber tube, the far end of which rests in an antiseptic solution. By this device, air can escape but none can enter. In the majority of cases it would seem wiser to make repeated punctures as needed, because the tube permitted to remain in the chest walls must sooner or later excite suppuration around it.

In pneumothorax dependent upon rupture of a superficial tubercular cavity, as it is in the majority of cases, the early indications for treatment are attention to the shock or collapse, pain, and dyspnœa. The shock must be treated on the general principles governing the management of this condition, *i.e.*, by hypodermic administration of whisky or brandy and Strychnia. Warm applications must be made to the trunk and extremities, and the patient must be kept at absolute rest—free from disturbance of anxious friends and relatives. If pain is at all severe, it is of the highest importance that it be relieved by a hypodermic administration of Morphia sulph., one-quarter of a grain. This remedy has the additional advantage of quieting the patient.

For slight grades of dyspnœa but little can be done; indeed, it may be said that nothing is necessary. When of high degree, its cause must be determined. When, as frequently happens, it is dependent upon air confined in the pleura under pressure, the treatment by paracentesis, as above stated, brings the desired relief. This relief is usually but temporary, and subsequent punctures are demanded. It has been proposed that in such cases a free incision be made; but this procedure is generally condemned because it will almost certainly develop an empyema. The advocates of incision claim that suppuration is certain to follow under any circumstances, and look upon this as an argument for their practice. As a matter of fact, we are sometimes fortunate in having pneumothorax followed by no effusion at all or by one that is serous in character. To destroy our chances of having this beneficent result does not seem to be good practice.

When the dyspnœa persists despite the above treatment it is in all probability dependent upon a high degree of congestion of the "well" lung and disturbance of cardiac function. This must be treated on the ordinary principles governing the management of such conditions. Some advocate venesection under these circumstances, because this procedure will surely relieve the right ventricle, which is in danger from over-distention.

With the emergency of the early hours of the case attended to there remains nothing for the physician to do but to watch symptoms and treat accordingly, while he awaits the effusion, which may be either serous or purulent. If so fortunate as to have the former his labors are much lightened. Many times, though unfortunately in the minority of cases, the effusion disappears spontaneously. If, on the other hand, it should remain after two or three weeks, paracentesis should be performed. Under no circumstances should the aspirator be used for this purpose, because of the danger of again injuring the lung.

If the case should develop into a pyopneumothorax the problem becomes a difficult one. The purulent effusion cannot be absorbed; this is certain. Operative intervention is necessary, but the question is, when? It may happen, of course, if the case be let alone, that the pus may make its way out through the lung and an ultimate recovery result. But this is too problematical to be depended upon. The patient must, moreover, pass through a long and exhausting illness. Temporizing by paracentesis does not seem to be of any advantage, as in some cases of empyema, because cure rarely, if ever, follows this simple procedure. Radical treatment by incision then seems to be our remaining resource. Unfortunately, the results are by no means as favorable as in empyema. The reasons for this seem to be plain. In pyopneumothorax we have an association with pulmonary tuberculosis in the vast majority of cases, while in empyema we are

generally favored with a healthy lung. There does not seem to be added any danger by reason of the association of air with the purulent accumulation, for this is the ultimate condition in all cases of empyema treated by incision. In many quarters it is the custom to defer operation on cases of pyopneumothorax to the last moment. This should, in great measure, account for the unfavorable results of surgical treatment. The trend of modern surgical thought is in the direction of early incision, *i. e.*, operation as soon as it is known that the fluid in the pleural cavity is purulent. No deference should be paid to the unproven assertion that the compression of the lung by the fluid stays the progress of the tubercular lesion, or that re-expansion of the lung excites the latter to activity.